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Results of the August 1977 Soviet and American Meteorological Rocketsonde Intercomparison Held at Wallops Island, Virginia

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National Aeronautics
and Space Administration

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PREFACE

Meteorological information on the structure and general circulation of the upper stratosphere and mesosphere was developed from data derived through certain indirect measurements and, in more recent years, from direct measurements such as obtained by meteorological rocketsondes. Obviously, atmospheric research requires reliable and sufficient measurements to specify parameter means and their variability, and to achieve an understanding of the various atmospheric phenomena and anomalies that contribute to the variability. Large-scale annual, semi-annual, and longer period (e.g., quasi-biennial) changes in the atmosphere can account for considerable differences between summer and winter seasons, for example, stratospheric pressure changes of over 100% has been observed near the poles. Furthermore, synoptic systems cause large temperature variations throughout the high latitude stratosphere which clearly influence the dynamics and climatology of the winter hemisphere, and aid in producing the observed variability. This variability is a principal characteristic of the upper stratosphere and lower mesosphere which makes acquisition of reliable data critically important. The value of the data lies in the representativeness of the profiles. Sensing systems for the measurement of temperature and wind have been developed by various countries, but to intelligently apply these different data to high altitude atmospheric studies it is extremely important that the measurements be compatible. To achieve compatability a number of meteorological rocketsonde intercomparisons have been held and have been widely reported on. The most recent intercomparison was between the United States and the Union of Soviet Socialist Republics. This intercomparison was planned as part of the 1971 agreement between the National Aeronautics and Space Administration and the Soviet Academy of Sciences which called for an exchange of meteorological rocketsonde data from western and eastern hemisphere launch sites. This report provides final data and results from that intercomparison.

We are especially indebted to Dr. Morris Tepper of NASA and Dr. L. A. Alexandrov of the Hydrometeorological Service for their continuing interest in making this intercomparison a success. We greatly appreciate the efforts of Dr. Robert Krieger, Director of NASA Wallops Flight Center, Virginia, for hosting the intercomparison at Wallops Flight Center and to the personnel of NASA Wallops Flight Center and the USSR Research Vessel Akademik Korolev whose expertise made the mission such a great success.

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SUMMARY

In 1971, the National Aeronautics and Space Administration in the United States and the Academy of Sciences in the Union of Soviet Socialist Republics, agreed to a coordinated program of rocketsonde investigation. The two agencies agreed to meridional measurements in the stratosphere, theoretically from the North to South Poles, along about 60°E and 70°W Longitudes. The Americans agreed to coordinate launchings along 70°W with the Cooperative Meteorological Rocket Network (CMRN) in the US and the Experimental Inter-American Meteorological Rocketsonde Network (EXAMETNET) in the Southern Hemisphere and the NASA launch site at Wallops Flight Center, Virginia. The Hydrometeorological Service of the USSR, on behalf of the USSR Academy of Sciences, agreed to provide data from sites along 60°E. It was recognized early in these investigations that the rocketsonde instruments used by the US and USSR needed to be compared if useful results were to be obtained. An intercomparison of rocketsondes sponsored by the Committee on Instrumentation and Methods of Observation (CIMO) of the World Meteorological Organization (WMO) was held in 1972 and 1973 and satisfied this need. France, Great Britain, Japan, the Union of Soviet Socialist Republics, and the United States participated in this rocketsonde comparison. It was learned that large differences existed between the measurements obtained with the US and USSR instruments. After examination of the instruments and adjustments to techniques were

completed, it was agreed that an intercomparison of the US Super Loki Datasonde and the USSR M100B rocketsonde should be conducted. The time was set for August 1977 and the launchings took place at Wallops Flight Center.

It was agreed that 22 pairs of rocket instruments, each pair to be comprised of a US Datasonde and a USSR M100B, would be launched. Half of them were scheduled for daytime launching and half for nighttime. The actual launchings commenced on August 10, 1977, with the Soviets launching from their ship, the Research Vessel Akademik Korolev, and the Americans from the launch complex at NASA's Wallops Flight Center, Virginia. Except for minor variations in the launch schedule, all rocketsondes were launched as planned.

Results obtained indicate US/USSR rocketsonde measurement agreement improved since the 1973 intercomparisons. It was learned that the mean of the differences of the temperatures compare to within 6°C at about 60 km and to within 2°C near 50 km. However, the root-mean-square differences are much larger. Wind measurements were found to agree, in the mean, to within 3 ms^{-1} up to 57 km.

Although this final report of the US/USSR Rocketsonde Intercomparison provides results which satisfy the need to understand how well each instrument agrees with the other, there is still a large number of studies which can be, and should be, carried out with the data sets provided in the Appendixes. Recommendations are given on how the instruments can be better understood.

INTRODUCTION

During recent years the importance of meteorological rocketsondes for observing the stratosphere and mesosphere became evident. The data they produced since the late Fifty's provide valuable statistical information on the behavior of the upper stratosphere and mesosphere leading to a better understanding of: semi-annual and biennial wind variations in the equatorial regions, seasonal reversals, the variation of the stratopause. These data have also made possible the updating of Standard and Reference Atmospheres (ref. 1, 2), and led to the study of many, many more processes. The data have been especially valuable for deriving reliable quantitative estimates of the general circulation and its driving mechanisms. For example, there has been a continuing effort to document the development of stratospheric sudden warmings (ref. 3). These warmings were first reported in 1952 by Scherhag (ref. 4), and, understandably, are the major perturbation affecting the winter circulation. Hence an increasing number of reports using results of rocketsonde data became available in the scientific literature. Generally, these results include synoptic, dynamical, theoretical, climatological, and diagnostic studies (refs. 5, 6, 7, and 8). In order to conduct this viable research it is necessary that the investi-

gator be aware of the methods used to produce rocketsonde data, and that he be assured that all available data are uniform and compatible. It is important, therefore, if compatability is to be assured, that rocketsonde instruments of various countries be compared with each other from time to time.

In August 1971, the United States and the Union of Soviet Socialist Republics agreed to exchange data from launch sites along two meridional zones, one in the Eastern Hemisphere (near 60°E) and one in the Western Hemisphere (near 70°W). In this connection it was recognized that the measurements from the Eastern and Western Meridional Networks should be compatible if successful global analysis is to be accomplished. Indeed, the necessity for an intercomparison was soon realized when global stratospheric analysis of the temperature data revealed that the measurements made in the Eastern Hemisphere above about 40 km were consistently colder than those of the Western Hemisphere. This problem of data comparability had long been recognized by the Commission for Instrumentation and Methods of Observations (CIMO) of the World Meteorological Organization (WMO) and it recommended that rocketsondes be intercompared. Such an intercomparison test was planned for 1972 (ref. 9). However, because of the difficulty in choosing a site and a time which was mutually agreeable to all the interested participants, the intercomparison was conducted in two parts. The first, at Wallops Flight Center in March 1972, with France, Japan, and the United States participating, and the second in September 1973, at Kourou, French Guiana, with Great Britain, France, the Union of Soviet Socialist Republics, and the United States participating. The intercomparison held at Kourou satisfied the August 1971 requirement for a comparison of US and USSR rocketsonde systems.

The results of the 1973 phase of the CIMO-sponsored intercomparison (ref. 10) showed that at 65-70 km the difference between the US and USSR temperatures was approximately 15°C, after corrections were applied. Similarly, large wind differences were noted above 45 km. Thus, the intercomparison test was extremely valuable in identifying instrumental differences and determining the magnitude of the adjustment values. These adjustments could now be applied to the measurements so that the reported temperatures could be made comparable. After the intercomparison in Kourou, the US and USSR rocketsonde systems were carefully analyzed. It was determined that the shape of the Soviet M100 thermometer supporting arm was creating a shock wave which was influencing the temperature measurement. In addition, the existing parachute design allowed for a high fall velocity and a large oscillating spiral motion which also seriously influenced the temperature and wind measurements (ref. 11). Accordingly, changes were incorporated, such as, a new thermometer sensor mount and parachute design and an improved sample rate of the trajectory and telemetry measurement parameters. During this same period the US investigated its system. The sensors employed were considered satisfactory, and, therefore, no changes to either the thermistor or decelerator were undertaken. Investigation of the thermistor corrections suggested that additional work was needed. Two independent efforts were persued, one to

determine the appropriateness of the temperature corrections and the second an error analysis of the temperature measurements. Results indicated that the temperature corrections (ref. 12) being applied up to 60 km were satisfactory, and those between 60 and 70 km, while quite large, were nevertheless reasonable. The error analysis study (ref. 13) showed that an uncertainty in the corrected measurement of about 6°C at 60 km existed. This uncertainty was more than two times as large (~15°C) at 70 km.

The various discrepancies described were discussed at the joint US/USSR Working Group meeting on Space Meteorology held at NASA's Goddard Space Flight Center during March 3-7, 1975. In view of the changes and improvements to the rocketsonde systems and reduction techniques that were planned or were being accomplished it was recognized that another intercomparison between the US and USSR rocketsondes was needed. It was agreed that one should be held during the summer of 1977. Wallops Flight Center, Virginia was considered to be the most practical location to hold the intercomparison since precision, "C"-band, tracking radars were available. The coastal location of Wallops made it convenient for a USSR Hydrometeorological Office research ship to anchor near Wallops, thus the intercomparison could be conducted in the same approximate space and time regime. Soviet shipboard equipment is identical to that used at the standard Soviet land-based station. A second meeting of the joint US/USSR Working Group was held in Moscow during November 1976 to discuss and jointly plan the operational aspects of the intercomparison.

INTERCOMPARISON TEST PLAN

Objectives

The primary objective of the intercomparison campaign was to identify measurement differences in the standard rocketsonde systems used by the US and USSR, and to improve the understanding and comparability of the temperature and wind measurements. Better understanding of the instruments' similarities and differences will lead to enhanced utilization of both sets of measurements, especially in the field of synoptic studies. Determination of the magnitude of the temperature difference allows the sides to make meaningful adjustments in order to analyze synoptic upper air charts. Adjustments to wind measurements are considered impracticable, but intercomparison results will indicate the altitude to which wind data can be effectively and jointly utilized.

Scientific Consideration

In order to obtain statistically meaningful results it was necessary that a large data sample be available. The US and USSR each launched 22 operational rocketsonde systems. The systems were launched in pairs, with a US and a USSR system launched close together in time. The launch plan called for the US Super-Loki Datasonde and the USSR M100B observations to be made not more than 30 minutes apart. The objective of such a small time difference was to insure that a comparison of the measured temperatures and winds would be obtained with minimal interference from natural small-scale atmospheric changes. Similarly, the launchings were conducted so as to minimize the spatial separation between systems in order to reduce effects due to atmospheric gradients. This was of some concern since the US launched their systems from Wallops and the USSR launched their rocketsondes from the Research Vessel Akademik Korolev located about 10 km southeast of the Wallops facility. The trajectory of each system is different and ballistic wind effects on the launch vehicle and conditions existing in the launch and impact areas dictated different launch directions. It was agreed, however, that each system at its apogee should be within 50 km of each other. In order to minimize measurement differences due to radiation each pair was launched completely in sunlight, or completely in darkness. This insured similar radiation conditions on both instruments. This is important since temperature sensors are affected by both short- and long-wave radiation, and measurements made under different conditions may introduce differences in the measurements which are difficult to explain. Mission criteria were established that temperature data should be obtained between 30 and 65 km altitude and wind data between 30 and 60 km.

A third measurement system was included to provide an independent source for comparison. Six US Super-Loki Sphere systems were launched with selected pairs of rocketsonde systems. The Super-Loki Sphere is capable of providing density and wind data to about 90 km. Temperatures are then obtained using the perfect gas law. In addition, five sensors originally used on the M100 system were to be launched on the M100B. That is, five M100B systems would provide measurements from both the old USSR temperature sensor and the new temperature sensor. This permitted temperature differences between the old and new sensors to be reconciled since not many comparisons were available after the changes were made to the USSR's rocketsonde.

It was agreed when the intercomparison test plan was designed that the US would attempt to track at least four USSR payloads with one of the Wallops precision "C-band" radars so that a comparison of techniques would be possible. The US reduced its radar track data using the standard Wallops meteorological data reduction program and the USSR reduced their data using their standard program. Raw radar data and reduced wind data were exchanged. The results should reveal whether wind differences are induced by the

different radars, by the data reduction program, or by the decelerator performance.

One final and important aspect of the intercomparisons is to know the measurement precision of each type instrument. This is important in order to separate instrumental effects and atmospheric variability. It was agreed at the November 1976 meeting in Moscow, that repeatability launchings would be made to determine the variance of wind and temperature measurements from the Datasonde and M100B. A minimum of five pairs of instruments were launched with the time difference between each rocketsonde in a pair kept to a minimum. Results of the repeatability tests were exchanged prior to the intercomparison test.

SYSTEMS DESCRIPTION

US Flight Systems

Super-Loki Datasonde - The Super-Loki Datasonde System consists of the Super-Loki rocket motor with a heavy interstage adapter and the nonpropulsive Datasonde dart with a high ballistic coefficient. This system is launched from a 3.66 meter long helical rail launcher which provides support and imparts spin to the system during the launch phase. The rocket motor is a high-thrust, solid propellant unit with a short burning time of approximately 2 seconds. At rocket motor burnout, dart separation occurs. The dart consists of an ogive, body assembly (dart body), and tail assembly. The dart body contains the decelerator and instrument payload. The dart tail contains the delay and ejection system. After separation from the rocket motor the dart coasts to apogee (~30 km) where payload ejection from the dart body occurs at 120 seconds after liftoff. Upon ejection, the ram-air inflated decelerator controls the rate of payload descent. The Datasonde instrument transmits on a carrier frequency of 1680 MHz. Table 1 gives the operating characteristics of the Datasonde. Figure 1 is a drawing of the Super-Loki Datasonde System, and Figure 2 is a drawing of the payload expulsion.

The Datasonde Wind Sensor is a ram-air inflated decelerator called a "Starute." Portions of the "Starute" have been metalized to facilitate radar tracking. Figure 3 is a drawing of the "Starute" and instrument sections in descent mode. Atmospheric wind data are obtained from the positional data taken by the tracking radar.

The temperature sensor is a small, aluminized bead thermistor (about 0.25 mm in diameter) whose electrical resistance varies inversely with its temperature. The thermistor is attached to a mylar loop mount by means of short lead wires. The mylar loop is coated with thin aluminum on the side facing the transmitter and serves to reflect long-wave radiation from the instrument's body. Figure 4 shows the details of the loop amount. As the instrument descends, the thermistor resistance controls the modulation rate of the

Datasonde Dart	Weights
Dart Hardware (kg)	4.04
Parachute (kg)	0.154
Instrument (kg)	0.040
Complete Dart (kg)	4.53
Booster Rocket Motor (kg)	22.68
(kg)	
Interstage (kg)	3.06

Rocket Motor Without Interstage Characteristics	
Length (cm)	200.33
Diameter (cm)	10.16
Inert Weight (kg)	5.90
Propellant Weight (kg)	17.01

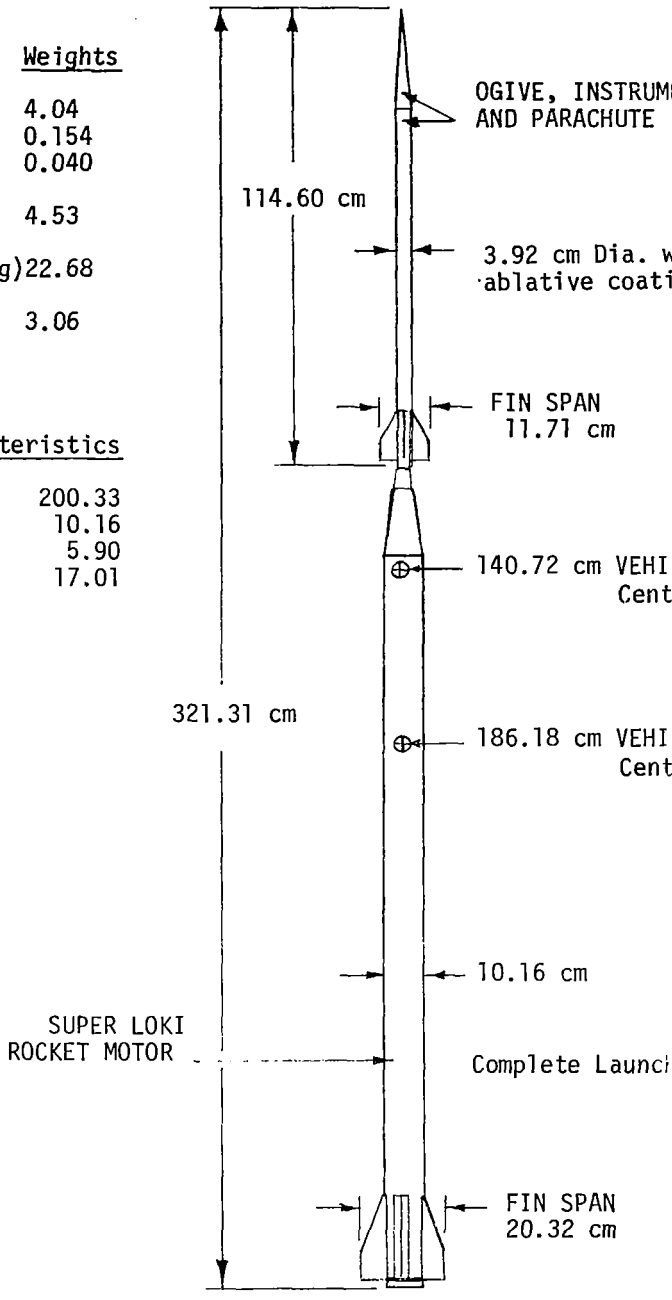

Figure 1. Schematic of the US Super-Loki Datasonde syst
dimensions and weights of the various compone

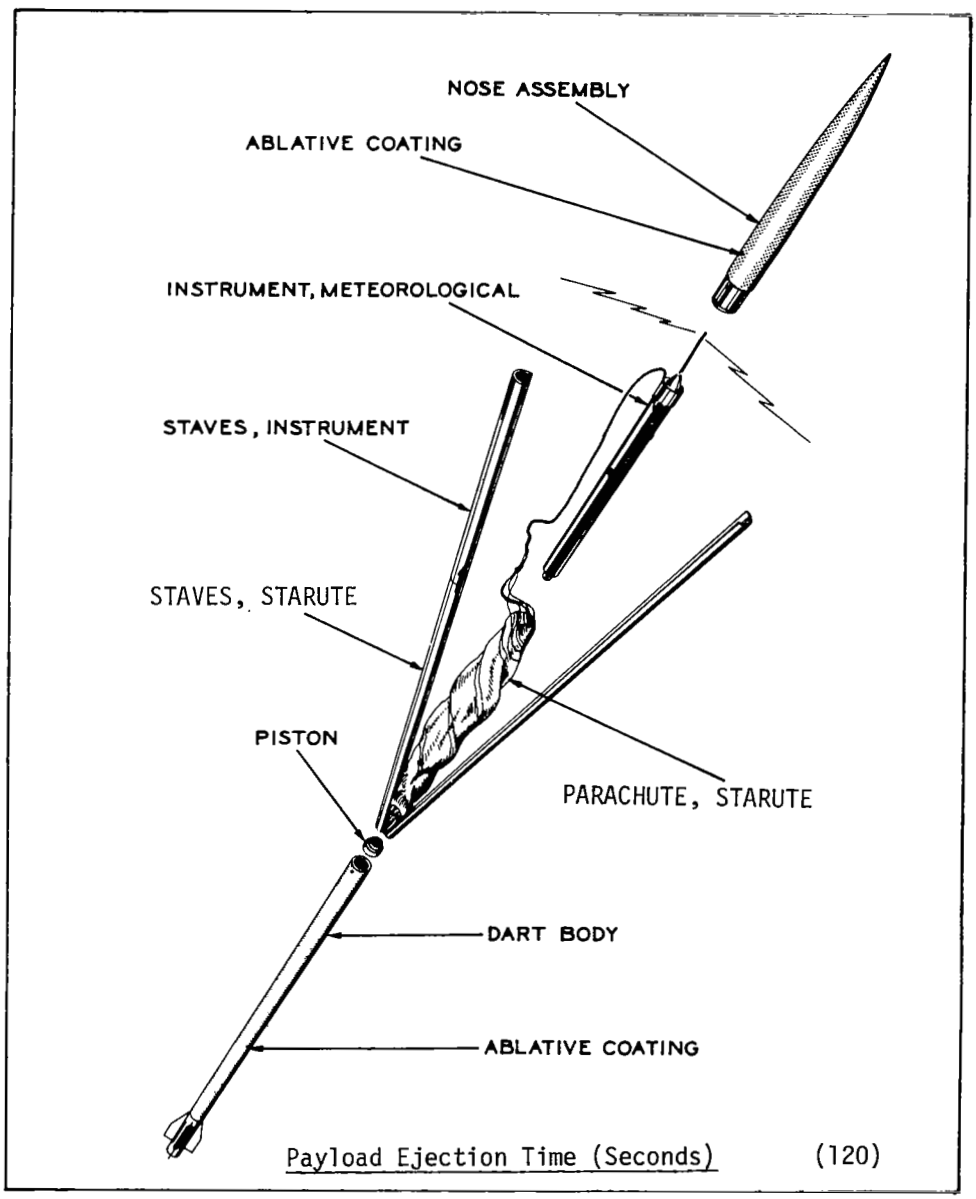

Figure 2. Sketch of Datasonde payload expulsion.

Descent System Characteristics

Parachute Type	Ram-air inflated
Canopy Material	1/4 mil mylar
Flying Width (m)	1.3
Flying Area (m^2)	4.55
Parachute Weight (grams)	155
Parachute-Sonde Ballistic Coefficient (kg/m^2)	.146

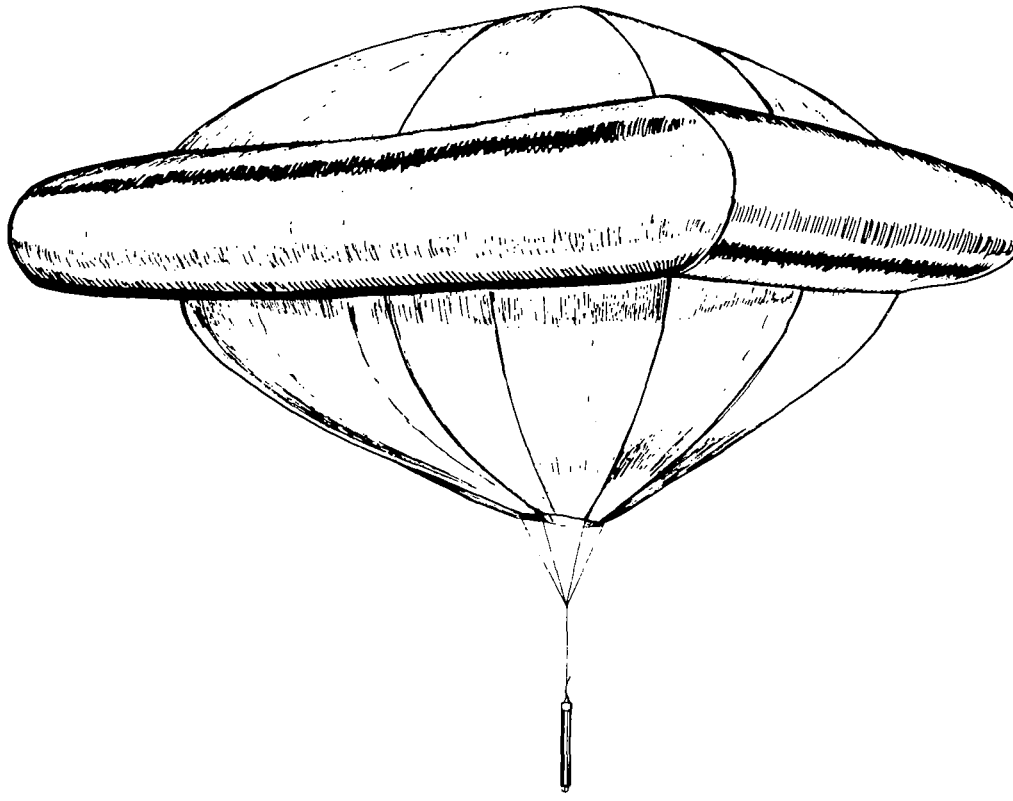

Figure 3. Super-Loki Datasonde Starute configuration.

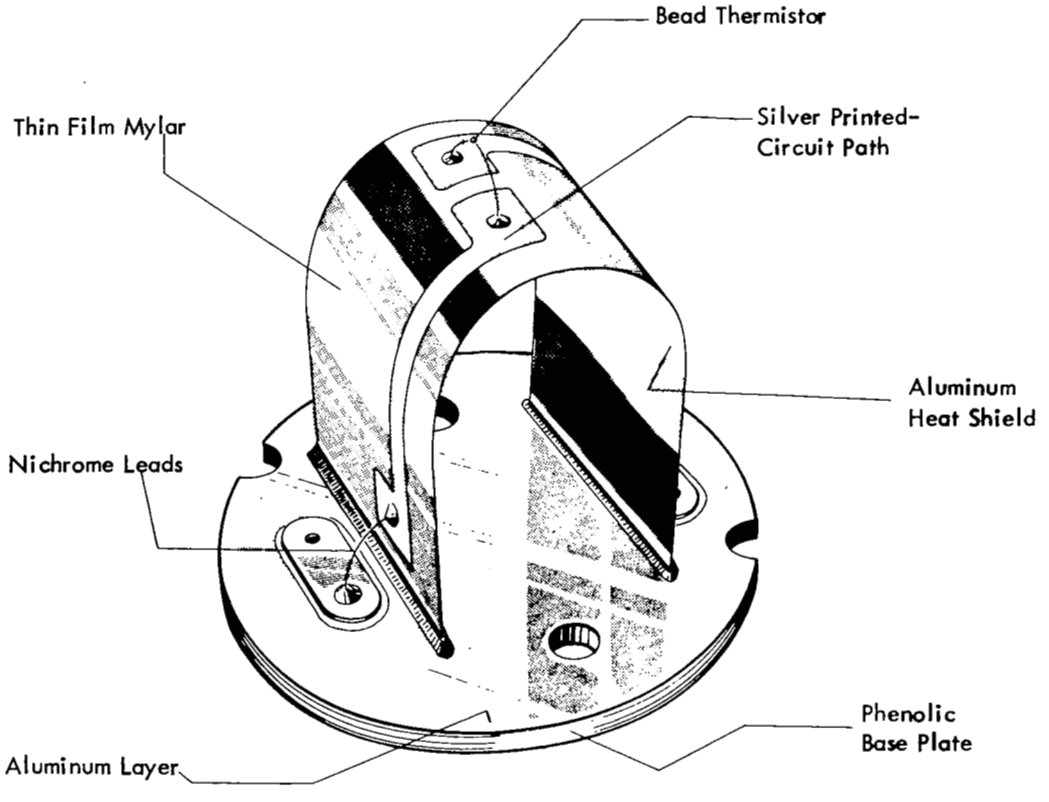

Figure 4. Details of thermistor loop mount.

TABLE 1. DATASONDE INSTRUMENT INFORMATION

Power Output (mw)	400
Modulation	PFM
Pulse Width (μs)	65-115
Pulse Repetition Rate (PPS)	10-200
Polarity of Modulation	Negative
Time Reference is Transmitted (sec)	6-10
Time Temperature is Transmitted (sec)	30-60
Frequency (MHz)	1660-1700
Reference Switching	Relay
Batteries	Nickel Cadmium
Operating Time (minutes)	40-50
Battery Voltage	6.25
Length (cm)	28.2
Diameter (cm)	2.8
Thermistor	0.25 mm (10-mil) Aluminum coated bead

data circuit. The temperature data received at the ground are interrupted periodically through electronic switching to permit the transmission of a reference resistance.

Super-Loki Sphere System Description - The Super-Loki Sphere vehicle, as shown in Figure 5, consists of a 4.128 cm diameter dart second-stage and the Super-Loki rocket motor. The dart body is coated with an ablative material to reduce the effect of rather severe aerodynamic heating upon the sphere payload. The sphere inflator contains a percussion initiated time delay charge to initiate sphere inflation after deployment from the dart body at an altitude of 115 km. Table 2 contains sphere characteristics.

TABLE 2. SUPER-LOKI SPHERE CHARACTERISTICS

Diameter	1 meter
Balloon Material	Aluminized 1/2-mil mylar
Construction	20 gores
Sealing	1.27 cm heat pressure sensitive Mylar type
Inflation Gas	Cis-2-Butene
Inflation Gas Weight	19.16 gm
Balloon Weight	66.50 gm
Inflator Weight	82.50 gm
Total Sphere System Weight	167.73 gm
Radar Cross-Section ("C"-Band)	0.785 m^2
Design Deflation Altitude	32 km

The falling sphere payload is a 1-meter diameter inflatable spherical balloon. The balloon is made from 1/2-mil mylar which is aluminized for radar tracking. After ejection from the dart at apogee, a capsule of cis-2-Butene is used to inflate the sphere to a

Super-Loki Sphere	Weights
Dart Hardware	5.954 kg
Sphere System	.168 kg
Complete Dart	6.122 kg

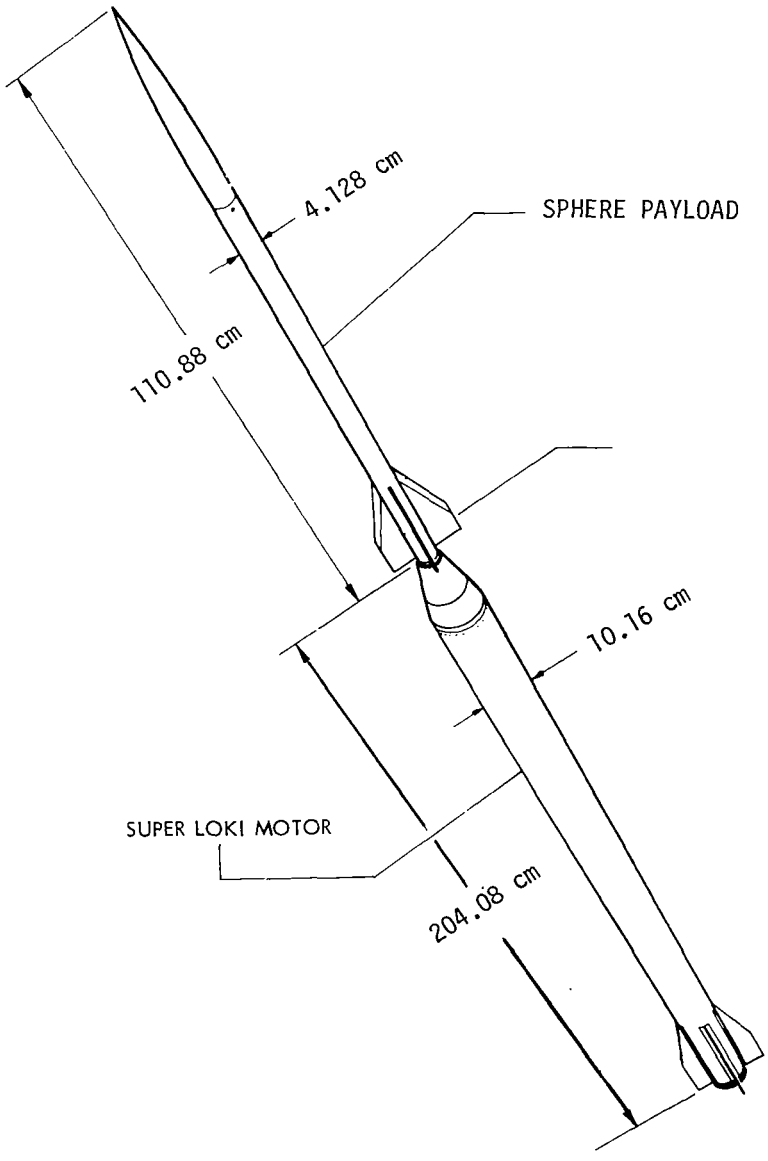

Figure 5. Schematic of the US Super-Loki Sphere system showing dimensions and weights of various components.

superpressure equivalent to 32 km altitude. The inflator has been designed to delay the initiation of inflation until six seconds after payload ejection. This has been done to protect the thin balloon skin from damage during the ejection process. The inflator also has a two-stage inflation feature to achieve a relatively slow and controlled inflation rate.

Atmospheric density and wind data are derived from a precise radar track of the descending inflated sphere. Temperature data are then obtained through the application of the perfect gas law.

US Ground Systems

FPS-16 and FPQ-6 Radars - The FPS-16 and FPQ-6 radars are high precision, "C-band" radars operating at a frequency of 5400-5900 MHz. The range precision of the FPQ-6 radar is ± 3 meters and angular precision is 0.05 mil or approximately 0.0028 degree. The range precision of the FPS-16 is also ± 3 meters with an angular precision of 0.1 mil or 0.0056 degree. Normal track data recording rates are at 10 per second. Data are recorded on magnetic tape in digital form for computer reduction.

Ground Meteorological Device - GMD - The GMD is a ground meteorological receptor which has been in use in the United States for approximately 40 years. Although old, the equipment has proven to be reliable, functional, and quite serviceable. The receiving system operates at 1680 MHz and is compatible with the flight system's frequency. The antenna tracking system operates automatically using error voltages developed by a scanner located on the antenna. Angular data from the antenna system are not used for rocketsonde tracking. The telemetry data are recorded continuously over a range of 0-200 Hz on a strip chart which moves at approximately 5 cm per minute. Telemetry data are also recorded on magnetic tape in digital form for computer reduction.

USSR Flight System

The M100B is a two-stage, solid propellant, fin stabilized rocket. The first stage rocket is 250 mm in diameter, 4100 mm long, and burns for approximately 5 seconds; the second stage, of the same diameter is 1600 mm long and burns for approximately 4.5 seconds. First-stage separation is achieved by mechanically cutting a special pin using second-stage exhaust gases at second-stage ignition.

The rocket is launched from a spiral rail launcher which imparts 3.5 rps initial spin. Protective coverings of the temperature and pressure sensors in the nose cone are released 60 seconds after launch through a pyrotechnical device activated by a mechanical

timer initiated at liftoff. The nose cone is separated from the second stage 76 seconds after launch by means of a small separation motor, activated by another mechanical timer also initiated at liftoff. The rocket and its basic characteristics are shown in Figure 6.

Nose Cone With Payload Description - A spire at the head of the payload contains the measurement sensors. Four resistance thermometers of 40 micron-diameter tungsten-rhenium wires of the type shown in Figure 7 are located on two folded posts which are brought into measurement position 60 seconds after liftoff. The resistance of each thermometer under room temperature conditions is approximately 200 ohms. Two Pirani heat manometers for measuring static pressure are located in the head of the spire. The entrance ports of the manometers are located at a distance of six diameters from the tip of the spire. All sensors are connected to an imbalanced Wheatstone Bridge circuit, using a voltage of 3.11 volts. The telemetric frequency is 22.1 MHz ± 50 KHz. The on-board telemetry system operates on a principle of change in generator frequency in proportion to a change in the output voltage of the measurement Wheatstone Bridges. Sensors are then scanned through a 60-channel commutator. All 60 channels are sampled in five seconds. Telemetry transmitters operate at a power of 1.8 watts. A super regenerative radar transponder located in the nose cone with a frequency of 1780 MHz and an output power of 0.4 watts is used for receiving trajectory data. Angular tracking is accomplished through a continuous transponder signal. Short pauses in the transponder response to radar signals give range measurements.

During the intercomparison five rockets were launched using a new system of transponder telemetry. In this case, the instrument bridge voltage output controls the width of the pulse.

The M100B payload descends on a parachute which is shown in Figure 8. Winds are determined on the basis of the radar track data. The parachute is deployed after nose cone separation 76 seconds after liftoff and contains a system of forced inflation of the "circumference tubing" with freon-22. The parachute cross-section area is 50 m^2, with a total area of 120 m^2.

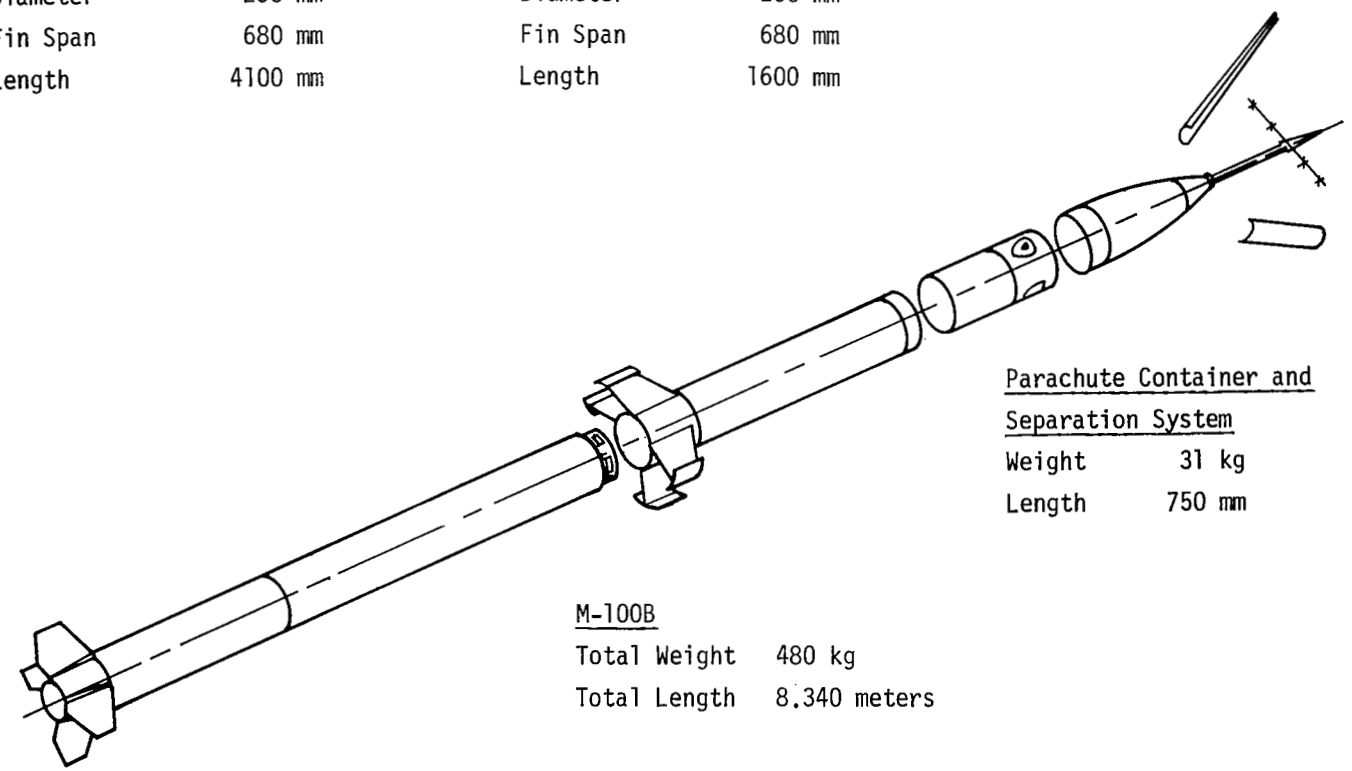

Figure 6. Schematic of the USSR M-100B rocketsonde system with dimensions and weights of various components indicated.

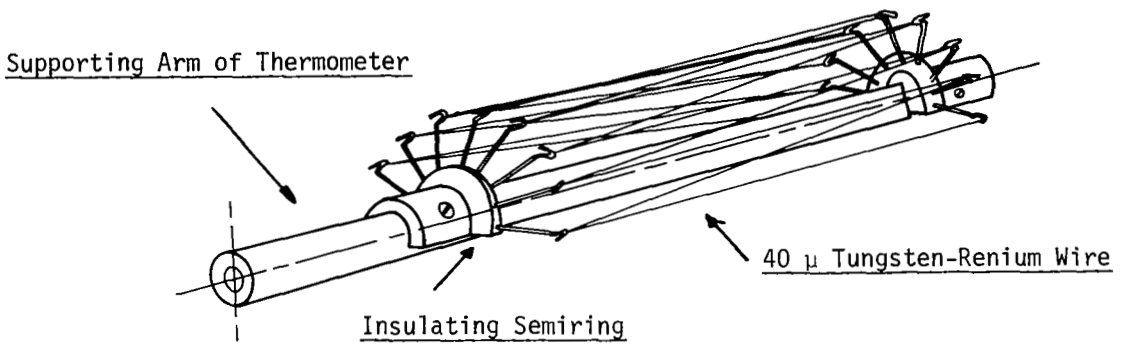

Figure 7. Sketch of USSR M-100B resistance temperature wire sensor.

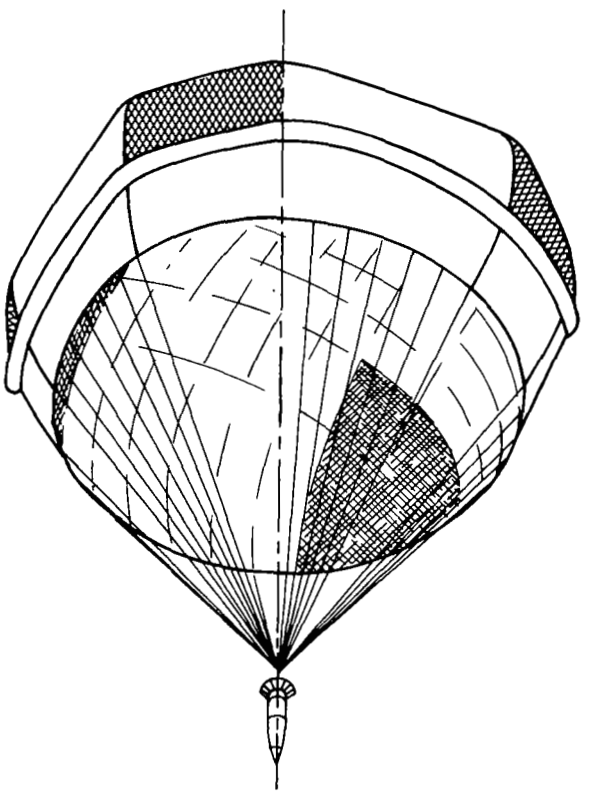

Figure 8. Sketch of USSR M-100B parachute system.

USSR Shipboard Instrumentation

Radar - The radar used for rocket soundings is a most important element of the measurements. The USSR radar "Meteorit-R" operates at a wavelength of 17 cm (1780 MHz) with a pulse energy of 0.25 megawatts, a halfwidth angle of 6°, and a 1.8 meter antenna diameter. Angles and slant range data are either film recorded at a one per second frequency or put directly into an electronic computer with parallel tape recording at a frequency of four times per second.

Angle error dispersion for the radar is 7.2 seconds and the mean square range measurement error is 40 meters. On ships the "Meteorit-R" radar antenna is mounted on a stabilized post, the position of the post is gyro stabilized to maintain a vertical position. Mean square error of maintaining horizontal position is from 5 to 7.2 seconds.

These radar characteristics are mainly responsible for the temperature and wind measurement errors. Taking into consideration the presence of time error correlation in the radar channels with correlation radius up to 1.5-2.0 seconds, for secondary data processing a two second time step is used.

Telemetry Station - For increased reliability, two telemetry stations are utilized. Each station includes an ordinary superheterodyne receiver and panoramic monitor with transmission frequency changes shown on the screen as horizontally displaced light dots. The screen is photographed on moving film. Telemetry data deciphering is done by hand.

General Remarks on Instrumentation - Instrumentation on the Research Vessel Akademic Korolev is standard for all rocket stations of the USSR.

OPERATIONS DESCRIPTION

The operations schedule for the intercomparison was determined by an exchange of correspondence many months prior to the dates of actual launchings. Many preliminary steps had to be arranged far in advance of the actual intercomparison and then finalized upon the arrival of the Soviet Research Vessel Akademik Korolev at Wallops Flight Center. For example, communications between the ship and the Wallops Flight Center control center were necessary in order to carry on a successful operation. Although communication frequencies were arranged, it was only learned after the arrival of the Akademik Korolev that problems in the communications equipment prevented use of this mode of contact. Consequently, a different method of communication was utilized. Similarly, air- and sea-lane clearances had to be worked out with the proper organizations as well as arrangements completed for customs and immigration clearances. Transportation of personnel between Wallops Flight Center and the Akademik Korolev was provided by the U.S. Coast Guard.

The Akademik Korolev anchored off Wallops Island, Virginia, at approximately 1300 GMT on August 5, 1977. Final details of the intercomparison plan and schedule were discussed on August 8 and 9, 1977 by the intercomparison managers and scientists. It was agreed that the launch schedule would commence on August 10th. These first launchings were to be used to insure satisfactory performance of the equipment, provide familiarity with each other's operations, and, in general, identify potential problems which could delay the successful completion of the operation.

In practice, the jointly agreed rocketsonde launch schedule was followed quite closely. However, weather events during the evening of August 17 prevented launchings. Severe thunder and lightning in the Wallops area caused two of the three scheduled pairs to be postponed. In order that the established number of desired night launchings would not be compromised these two pairs were rescheduled during the early morning of August 19th at about 0100 local time and the night of August 19th at 2100 local time.

Each side conducted its countdown independently. The liaison officers (the Soviet at Wallops Flight Center and American on board the Research Vessel Akademic Korolev) informed the launch supervisors of running countdowns and delay developments. The American liaison officer relayed messages from shore on the location of ships. Since the USSR personnel had responsibility for safety in the impact zone, and in fact, had sole cognizance of the Soviet launch operation and safety, they made all decisions whether to delay the launch, or change the launch azimuth. These mutual activities were conducted quickly and efficiently.

In accordance with a preliminary agreement five old-type Soviet thermometers were to be launched with new thermometers. The number of Soviet rocket launchings using both old and new thermometer structures was reduced from five to three. All three launchings were successful. Launchings of these Soviet rockets were accompanied by launchings of American Super-Loki Spheres. The American SPANDAR radar tracked all of the Soviet M100B rocket launchings while the precision FPQ-6 "C-band" radar tracked the previously agreed four rocket launches. Dates, times and other statistics of the successful launch pairs of the Super-Loki Datasondes, Super-Loki Spheres, and M100B are given in Table 3. Although failures of some systems occurred they are not included in Table 3. The reason for the failures is one of system reliability and, therefore, not directly related to the data comparison. Nevertheless, an engineering investigation was made to determine the cause of the failures and corrective action taken.

TABLE 3. INTERCOMPARISON LAUNCH DATES, TIMES, AND LAUNCH RESULTS OF THE VARIOUS US AND USSR ROCKETSONDE PAIRS.

Pair No.	Date	Time GMT	System	Apogee KM	Altitude Top Temp. KM	Altitude Bottom Temp. KM	Altitude Top Wind KM	Altitude Bottom Wind KM	Remarks
1	August 10, 1977	1400	B	72.0	63	24	63	24	Day
		1405	A	81.8	74	15	65	15	
2*	August 12, 1977	0405	A	81.7	50	15	50	15	Night
		0419	B	72.6	67	25	67	25	
3*	August 12, 1977	0606	A	82.3	76	15	60	14	Night
		0659	B	74.6	70	24	70	24	
4	August 12, 1977	1100	B	71.9	67	24	67	24	Day
		1105	A	81.0	74	15	62	15	
		1111	C	111.5	93	39	93	39	
5	August 15, 1977	1735	A	84.0	72	15	60	15	Day
		1744	B	72.1	68	24	68	24	
6	August 15, 1977	1930	B	78.9	70	25	73	25	Day
		1935	A	80.5	74	15	64	15	
		1942	C	112.7	94	30	94	30	
7	August 16, 1977	0105	A	79.8	65	15	66	15	Night
		0113	B	77.0	70	25	72	25	
		0123	C	111.3	93	44	93	44	
8	August 16, 1977	1835	B	76.1	70	24	70	24	Day**
		1840	A	85.3	77	15	70	15	
9	August 16, 1977	2000	B	78.3	70	24	75	24	Day
		2029	A	84.0	54	25	64	25	
		2032	C	115.4	94	30	94	30	
10	August 17, 1977	2015	A	85.8	80	15	65	15	Day
		2025	B	77.7	70	31	71	31	
11	August 19, 1977	0116	B	79.2	70	25	72	25	Night
		0120	A	84.3	78	15	70	15	
		0125	C	112.7	93	35	93	35	
12*	August 19, 1977	0300	B	77.0	-	-	70	51	Night
		0308	A	84.4	-	-	70	12	
13	August 19, 1977	0507	A	83.1	76	16	65	16	Night
		0524	C	113.8	94	34	94	34	
		0537	B	76.0	69	25	69	25	
14	August 19, 1977	2000	B	76.8	70	25	71	25	Day
		2005	A	83.0	78	15	60	15	
15	August 19, 1977	2205	A	82.3	76	15	70	15	Day
		2210	B	80.0	70	26	74	26	
16	August 20, 1977	0100	B	76.0	69	23	69	23	Night
		0105	A	83.1	77	15	68	15	
17	August 22, 1977	2308	B	74.0	69	24	69	24	Day
		2312	A	83.4	76	15	70	15	
18	August 23, 1977	0100	B	74.3	68	24	68	24	Night
		0106	A	83.9	77	15	70	15	
19	August 23, 1977	0339	B	76.0	70	25	71	25	Night
		0342	A	83.7	78	15	70	15	
20	August 24, 1977	0107	A	83.8	78	15	70	15	Night
		0128	B	72.7	67	24	67	24	
21	August 24, 1977	0300	B	75.3	70	29	71	29	Night
		0305	A	84.0	78	15	70	15	

A. USSR M100B
B. USA Super Loki Datasonde
C. US Super Loki Sphere

* Did not meet objectives of time difference or altitude range. Results were used for evaluation of measurement compatability.
** Soviet radar lost track - USA Spandar provided position data.

RESULTS OF REPEATABILITY INVESTIGATIONS

The repeatability investigations of the temperature and wind data which were agreed to be part of the intercomparison were carried out by the US and USSR. The tests included paired launchings with the most minimal time separation possible between launchings within a pair. Each side agreed to collect data on at least five pairs of launchings. Calculation of the root-mean-square differences provided an estimate of each instrument's precision. Six Super-Loki Datasonde pairs were obtained at Wallops Island during late May 1977; however, only three pairs successfully reached 70 km and four pairs reached 60 km, in all five pairs reached 54 km. Table 4 provides launch results. The USSR launched their repeatability test systems while enroute to Wallops Flight Center. Six pairs were obtained during July while the Research Vessel Akademik Korolev was in Pacific equatorial waters.

The US actually scheduled six pairs of Datasonde launchings within 24 hours. Since one pair was launched every four hours, an independent diurnal tidal analysis was possible but is not reported here since it was not part of the intercomparison plan. The USSR launched ten successful M100B systems which provided six pairs for analysis. Launch results are given in Table 5. Three launchings on July 25 were conducted during the day; the remainder were launched in darkness. Because of the long receipt time of the telemetry from the M100B payload the minimal interval between launchings was much longer than the interval possible for the US Datasondes. For instance, the shortest interval between systems within each pair was 80 minutes (on July 18). Generally, the majority of the time intervals between launchings was of the order of 90 minutes. The time interval between Datasondes launched within pairs averaged about eight minutes, with the longest separation being 17 minutes. This significant difference in the time intervals is basically due to only one Soviet launch rail being available on the mobile platform, while the US, launching from a fixed location, had multiple launchers and radars available. In general, the Soviet repeatability results indicate a greater variance than found with the American system; however, the launch separation of about one and one-half hours was relatively large and the results are expected to contain a contribution from natural atmospheric variability (ref. 14).

The computational methods used by the Americans and Soviets were different; however, examination of both data sets using both techniques revealed that for the most part approximately the same order of magnitude is obtained regardless of the computational procedure. The US originally calculated the root-mean-square difference at each altitude given by

$$RMS_{diff} = \left[\frac{\Sigma (T_1 - T_2)^2}{n} \right]^{\frac{1}{2}}$$

TABLE 4. DATES AND TIMES OF US REPEATABILITY LAUNCHINGS FROM WALLOPS FLIGHT CENTER.

Pair	Date	Time (GMT)	Temperature Top (KM)	Wind Top (KM)
1	May 27, 1977	1434	70	70
		1440	70	70
2	May 27, 1977	1839	70	70
		1845	70	70
3	May 27, 1977	2257	69	68
		2303	60	60
4	May 28, 1977	0230	53	53
		0240	70	70
5	May 28, 1977	0630	70	70
		0647	45	45
6	May 28, 1977	1042	70	70
		1047	70	70

TABLE 5. DATES, TIMES, AND GEOGRAPHIC POSITIONS OF USSR RESEARCH VESSEL AKADEMIK KOROLEV DURING LAUNCHINGS FOR REPEATABILITY CHECK.

No.	Date	Time (GMT)	Latitude Degrees	Longitude Degrees	Temperature Top (KM)	Wind Top (KM)
1	July 18, 1977	0631	18°25'N	149°12'W	70	65
2		0751	18°25'N	148°51'W	70	65
3	July 21, 1977	2030	14°17'N	126°15'W	70	65
4		2200	14°17'N	126°07'W	70	65
5		2330	14°15'N	125°54'W	70	65
6	July 25, 1977	0509	10°21'N	104°38'W	70	65
7		0640	10°17'N	104°12'W	70	65
8		0810	10°13'N	103°48'W	70	65
9	July 27, 1977	0304	07°53'N	93°03'W	70	60
10		0435	07°46'N	92°45'W	70	60

where T_1 and T_2 represent the first and second measurements of each pair and the sample size n is the total number of pairs at each altitude. The USSR on the other hand used the relationship

$$\delta^2 = \frac{\Sigma (T_1 - T_2)^2}{n-1}$$

where δ represents the dispersion or standard deviation. The value δ was next averaged in the vertical for 5 km by

$$\bar{\delta} = \frac{1}{5} \sum_{j=1}^{5} \delta_j$$

and the mean value assigned to the mid-point of the 5 km layer. Finally, this mean value was used to determine

$$\sigma = \frac{\bar{\delta}}{\sqrt{2}}$$

where σ represents the repeatability value.

A comparison of the two techniques, e.g., submitting US data to the USSR technique and the USSR data to the US technique, revealed no significant differences. Therefore, in order to maintain consistency throughout the repeatability analysis, all data were calculated using the Soviet technique. The results are plotted on the graphs shown in Figures 9 and 10. It should be noted that computations from only five pair of USSR data were available, since radar tracking of the July 21, 1977, 2330 GMT launch was considered inconclusive.

EVALUATION OF INTERCOMPARISON DATA

The observations, obtained in pairs, as shown in Table 3, were evaluated in a relatively simple manner. Means, standard deviations, and root-mean-square differences of corresponding US and USSR data were calculated at each kilometer altitude. Table 6 lists the sample size, mean of the differences, $\Delta(\ )$*, and root-mean-square differences, rms_{diff}, of the temperature and wind data. The same approach to the data analysis was used for both

*It should be noted that throughout this report the observation sample size is the same for the US and USSR in which case the mathematical result obtained from using mean of the differences or difference of the means is identical.

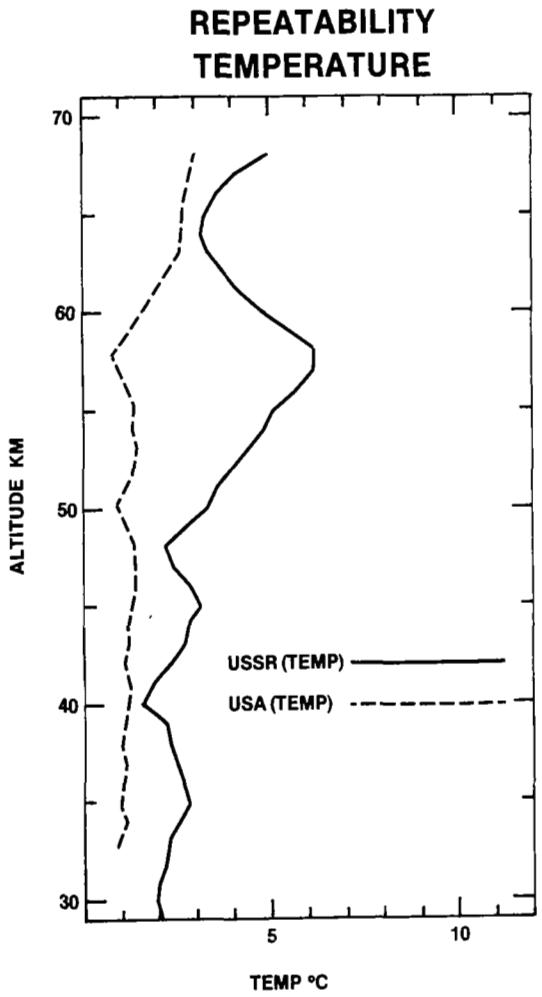

Figure 9. Profiles showing the temperature repeatability obtained from measurements with the US and USSR rocketsonde systems.

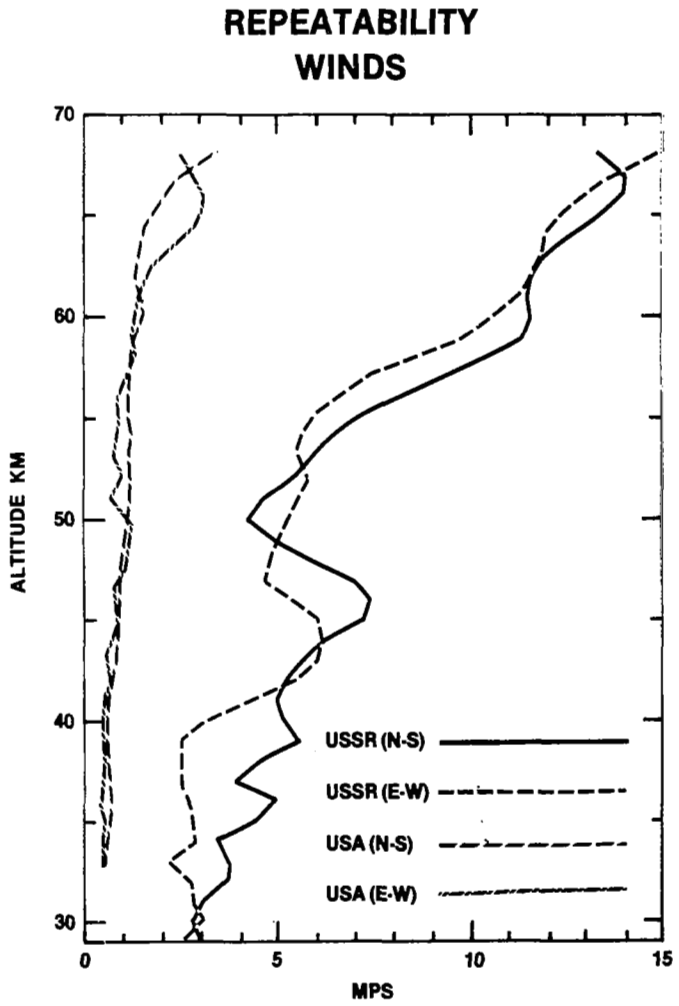

Figure 10. Profiles showing component wind repeatability obtained from measurements with the US and USSR rocketsonde systems.

TABLE 6. MEAN OF THE DIFFERENCES $\Delta(\ )$, AND ROOT-MEAN-SQUARE DIFFERENCES (rms_{diff}) FOR THE USSR(STANDARD) METHOD MINUS THE US(STANDARD) METHOD.

Altitude	Temperature (°C)						Wind				
	day			night			Meridional (mps)			Zonal (mps)	
km	n	$\overline{\Delta T_d}$	RMSD	n	$\overline{\Delta T_n}$	RMSD	n	$\overline{\Delta(N-S)}$	RMSD	$\overline{\Delta(E-W)}$	RMSD
70	5	-7.8	10.8	4	-14.3	14.3	6	-3.8	26.3	7.3	25.0
69	6	-11.8	15.2	6	-14.3	14.8	7	-1.0	18.5	1.1	22.5
68	7	-12.0	16.4	6	-16.2	17.1	8	2.4	13.0	-5.6	22.0
67	8	-14.6	18.3	8	-17.4	18.6	10	1.3	11.9	-8.7	19.0
66	8	-15.8	18.9	8	-18.4	20.5	11	-1.3	12.5	-1.7	21.9
65	8	-14.3	16.7	9	-14.6	15.8	13	-2.2	11.4	3.2	17.2
64	8	-12.0	14.8	9	-10.8	12.7	15	0.8	13.6	6.1	13.7
63	9	-10.7	13.3	9	-9.1	10.9	16	0.5	12.3	8.2	14.4
62	9	-8.9	11.7	9	-7.8	9.4	17	-0.5	9.5	8.4	12.7
61	9	-7.3	10.3	9	-6.4	8.3	17	-2.1	8.8	8.2	11.6
60	9	-6.0	8.4	9	-6.1	8.6	20	-2.7	10.0	9.7	14.2
59	9	-5.4	7.7	9	-4.9	7.8	20	-1.5	10.1	8.0	14.9
58	9	-4.3	6.3	9	-3.8	6.9	20	-1.2	9.6	5.1	14.5
57	9	-4.9	6.5	9	-3.6	6.0	20	-2.2	10.3	2.5	12.4
56	9	-5.9	5.9	9	-3.8	5.2	20	-4.4	12.1	1.7	10.2
55	9	-4.7	5.7	9	-5.1	5.8	20	-3.4	8.7	1.9	8.7
54	10	-3.6	4.7	9	-4.9	5.5	20	-1.8	7.3	2.0	8.3
53	10	-4.7	6.0	9	-3.4	4.1	20	0.7	7.5	1.3	7.8
52	10	-3.8	5.2	9	-2.2	3.1	20	2.0	8.6	-0.3	7.6
51	10	-4.1	5.3	9	-0.9	2.9	20	1.7	8.2	-1.1	7.6
50	10	-3.6	5.3	10	-0.7	3.0	20	0.6	8.0	-1.9	6.7
49	10	-3.2	4.7	10	-0.7	2.8	20	0.1	6.2	-1.9	5.8
48	10	-3.0	4.3	10	-1.1	2.5	20	1.1	4.0	-2.5	7.0
47	10	-3.8	5.4	10	-1.3	3.1	20	1.1	3.6	-2.6	6.5
46	10	-3.2	4.9	10	-1.8	2.7	20	-2.0	6.3	-0.9	5.3
45	10	-2.2	3.9	10	-2.4	3.1	20	-4.3	8.9	0.8	6.2
44	10	-1.7	3.8	10	-2.9	4.0	20	-1.9	6.6	-0.3	6.7
43	10	-0.9	2.8	10	-1.5	4.7	20	1.2	4.8	-1.8	4.4
42	10	-0.1	3.2	10	-1.0	3.9	20	-0.3	4.7	-1.2	3.9
41	10	0.4	2.2	10	-1.3	3.0	20	0.2	3.6	-0.3	4.0
40	10	-0.3	2.0	10	-0.6	2.8	20	0.3	4.6	0.6	4.1
39	10	-1.1	3.4	10	0.1	2.2	20	-1.6	4.3	-1.3	5.4
38	10	-0.9	3.1	10	1.4	2.1	20	-0.6	5.7	-1.3	4.5
37	10	-0.4	2.8	10	2.0	2.5	20	-0.3	2.7	-1.5	4.3
36	10	0.4	2.8	10	1.7	1.9	20	-0.4	3.9	-1.5	3.3
35	10	0.3	2.5	10	1.3	1.8	20	0.2	3.2	-2.1	3.0
34	10	1.3	3.3	10	1.3	1.9	20	-0.4	3.2	-0.5	1.7
33	10	1.7	3.0	10	1.6	2.4	20	-1.6	3.3	0.5	3.6
32	10	1.6	3.0	10	1.1	2.7	20	-0.7	3.2	-0.1	2.6
31	10	2.1	2.7	10	1.9	2.7	20	-0.3	2.5	-0.1	2.4
30	9	2.3	3.0	10	2.5	3.3	19	-0.3	2.5	-0.2	2.2
29	8	2.3	3.3	9	2.0	2.8	17	-0.9	1.6	-1.6	4.6

the temperature and component wind measurements. Because of new techniques being developed for the M100B instrument, two sets of data are made available for evaluation. These data sets, for purposes of identification in this report, are referred to as the USSR(standard) and USSR(prospective). This different treatment of the same data required that two comparisons be made with the USSR data set. Therefore, evaluations are provided for the US(standard)/USSR(standard) and the US(standard)/USSR(prospective) technique. Additionally, the data obtained with the US sphere system are compared with the US(standard) and both of the USSR techniques. Because of the length of the report required by so many individual data treatments only the US(standard) and USSR(standard) are resolved with any detail.

The USSR(standard) technique is defined (ref. 11) as the method of data processing according to the standard techniques used in the USSR during previous years. The USSR (prospective) technique is defined as having better characteristics of high-altitude resolution of temperature data which is planned for the future processing of rocketsonde data in the USSR. This change of the data processing technique is connected with the improvement of the thermometer design, aimed at eliminating systematic measurement errors caused by aerodynamic disturbances found with the previous design, and a new parachute which stabilizes the descent.

US(Standard) Technique vs USSR(Standard) Technique

The comparison between the US(standard) and USSR(standard) techniques is interesting. A considerable improvement in agreement between the US and USSR rocketsonde temperature measurements over that obtained during the 1973 Intercomparison held in Kourou, Fr. Guiana is immediately apparent. Results of that study (ref. 10) revealed differences between the US and USSR systems which reached a magnitude of about 15°C at 60 km. These values are indicated by the crosses on Figure 11. Above 50 km the results of the 1977 Intercomparison are in much better agreement than was found in the 1973 intercomparison. It is important to note that the relative similarity of the differences during day and night suggests that the corrections being applied for radiation are consistent in both US and USSR techniques. Obviously, the day and night radiation characteristic is the only element of the correction technique (refs. 15 and 16) which changes, i.e., the aerodynamic heating, lag, emissivity, and self heating terms are the same regardless of whether the observations are obtained during day or night. Nonetheless, the scatter in the measurement differences as shown by the root-mean-square difference curves in Figure 12, begins to grow above, about 55-56 km, indicating that unexplained instrumental effects may be contaminating the measurements, or, more likely, noise in the measurements are being introduced by natural atmospheric variability. Corresponding studies of the instruments' repeatability conducted as part of the intercomparison test, has determined that the

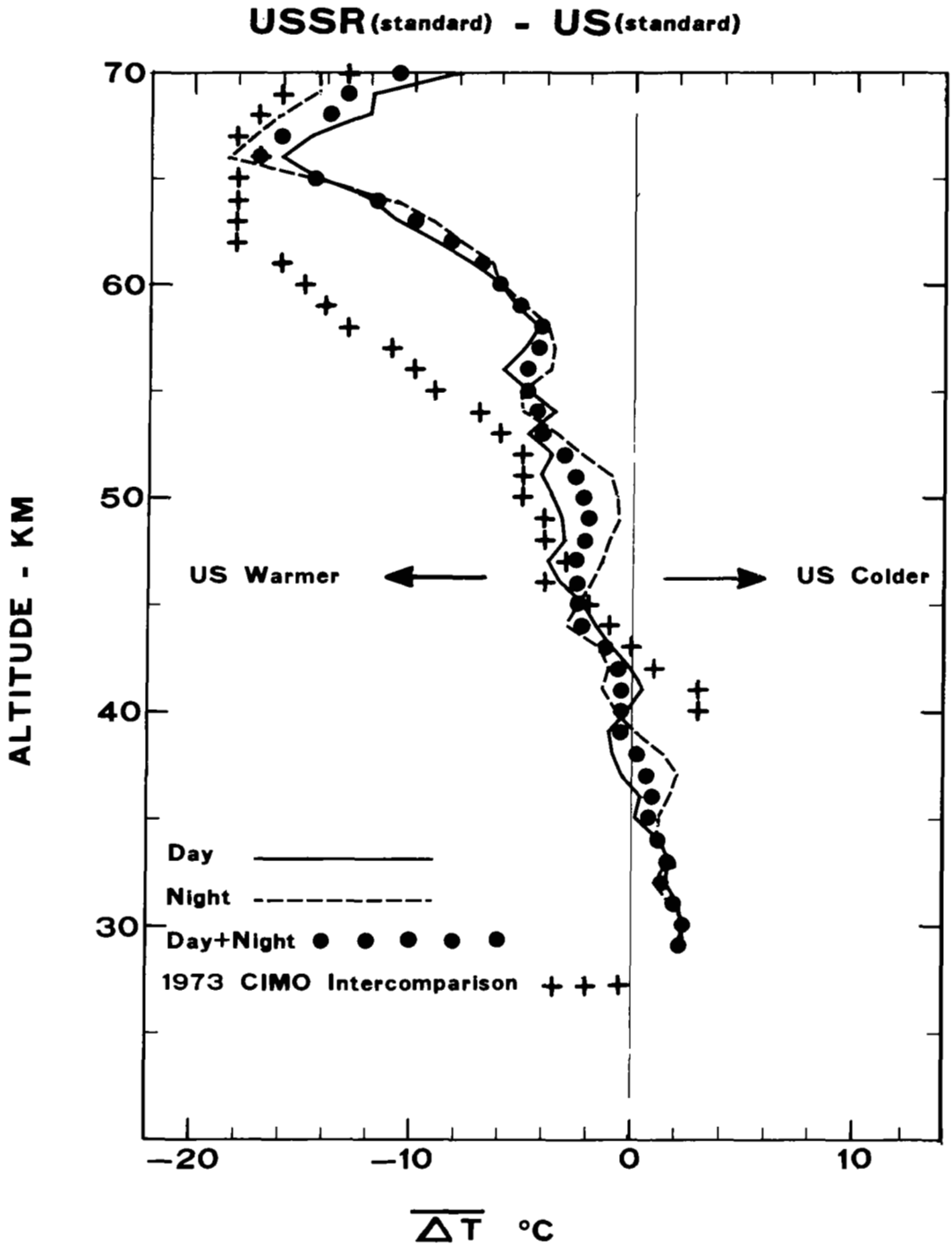

Figure 11. Profiles showing the mean of the differences of the measured temperature (ΔT) obtained from the US(standard) and USSR(standard) techniques for daytime and nighttime and a comparison of the results obtained from the 1973 CIMO-sponsored intercomparison with the present data.

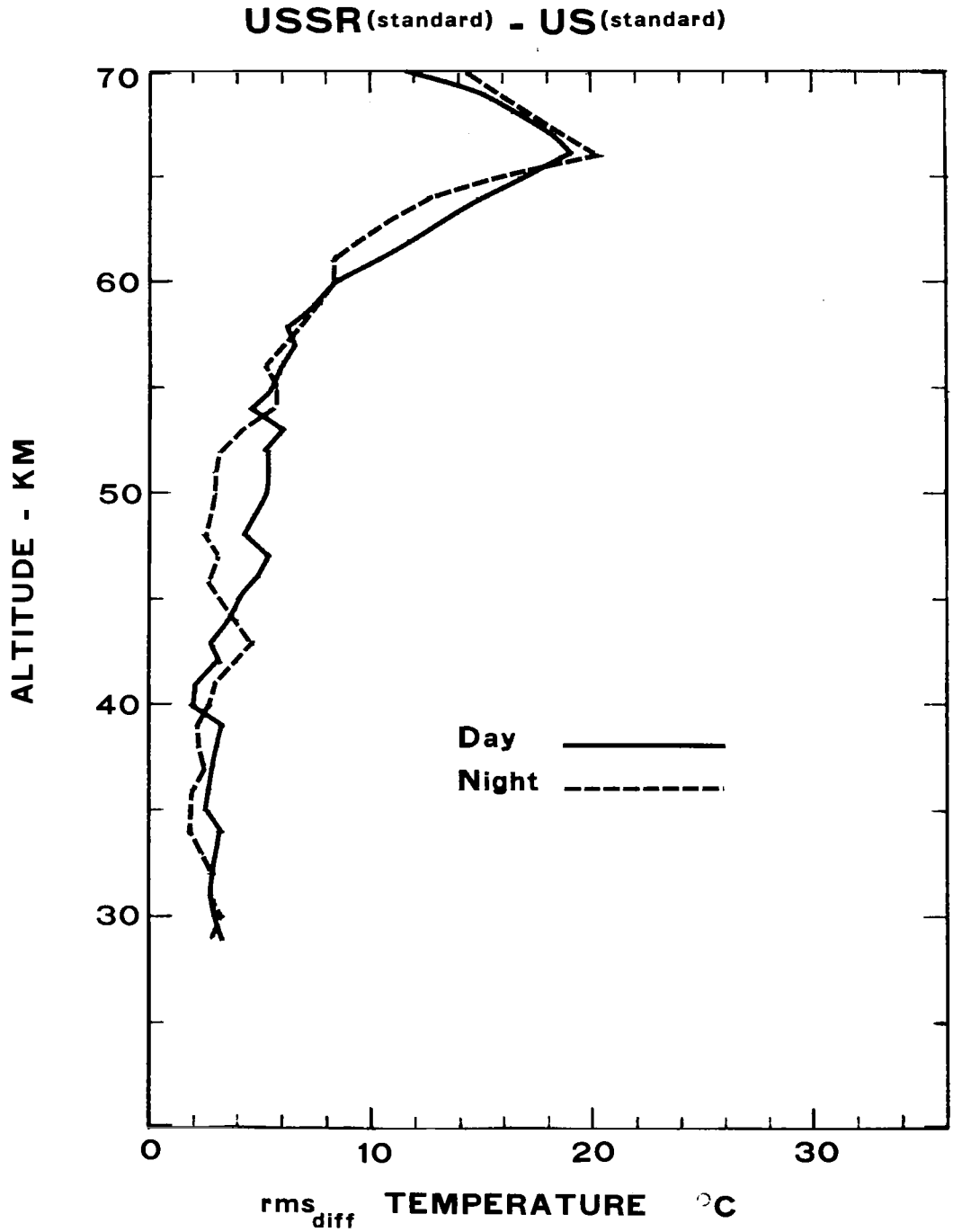

Figure 12. Root-Mean-Square differences (rms(diff)) of the temperatures obtained from the US(standard) and USSR(standard) technqiues during day and night.

instruments cannot be expected to obtain measurements with a precision better than 2-3°C between 60-70 km.

A comparison of the temperature measurements would not be complete without examining the actual profiles. These can be found in the Appendixes. It is apparent that each instrument responds quite well to changes of the lapse rate of the actual atmospheric temperature as shown by the level of detail present. Many temperature features were seen in both the Datasonde and M100B profiles. This suggests that both instruments can provide a valuable contribution to atmospheric research in spite of the bias which has been found to exist. Thus, synoptic use of the temperature data requires that this bias be taken into account. Since the bias is very similar for day and night measurements the value obtained from the total number of temperature measurements are listed in Table 7. These values, listed by altitude, are the adjustments which need to be applied to the reported measurements (assuming individual instrument corrections are made) which will bring the US and USSR temperatures into general agreement. The approach used in determining these values was to subtract the US measurements from the USSR measurements, thus, all adjustments are toward the US values. However, it cannot be assumed that the US measurements are absolutely correct. There is no way of determining which measurement is providing truth. The approach used here only provides a relative, but consistent way of determining what differences may exist.

TABLE 7

Adjustments to USSR reported temperatures considered necessary to achieve compatability to US values. The USSR(standard) and USSR(perspective) techniques are listed. Use of these adjustments assumes that the measurement data corrections have been applied.

Alt.	USSR(STANDARD)	USSR(PROSPECTIVE)
70	+ 11	+ 9
65	+ 14	+ 12
60	+ 6	+ 10
55	+ 5	+ 6
50	+ 2	+ 2
45	+ 2	+ 3
40	0	+ 1
35	- 1	- 1
30	- 2	- 2

Comparison of the wind differences is simply accomplished. Means of the differences and the root-mean-square differences of the meridional and zonal components are listed in Table 6. The comparison of the measured mean wind components, Figure 13, indicates that except for minor exceptions, differences of about 3 ms^{-1} exist below 57 km. Above this altitude, differences in the zonal component grow rapidly. Nevertheless, the root-mean-square differences, Figure 14, although not small, are still smaller than what would be expected from instrument repeatability alone. It must be concluded that agreement of the wind measurements is good to about 57 km, and, since phase differences with altitude were not found, are probably usable, in the mean, to higher altitudes.

US(Standard) Technique vs USSR(Prospective) Technique

Following the intercomparison data exchange, new data reduction techniques were investigated in the USSR. As a result of the new data this produced an additional evaluation with the standard US data was conducted. One aspect of such an outlook is that future data obtained from the M100B system can be brought into agreement with the US system's data, and indeed, with data from rocketsonde systems launched by countries participating in previous intercomparisons, such as the one held in Kourou. Table 8 provides a listing of the mean of the differences of the temperature and wind data for each kilometer between 24 and 70, and of the root-mean-square differences (rms_{diff}) of the same data. It can be seen in Figure 15 that for altitudes above 60 kilometers both the daytime and nighttime temperatures show differences larger than 10 degrees, while the rms_{diff}, Figure 16, suggest that the variation is relatively large. The mean temperature differences finally become less than about 5°C only below 54 kilometers. Comparison of the results obtained during the CIMO-sponsored Intercomparison in 1973 are plotted as crosses on Figure 15. It is obvious that some improvement has been made, but not as great an improvement as shown by the comparison of the standard methods shown in Figure 11. Table 7 lists the amount of adjustment to be applied to the measurements to achieve compatability. By comparing Figures 11 and 15 it is easily seen that the prospective technique shows improvement in the temperature agreement only above 64 km.

The direct comparison of the US and USSR standard techniques conducted here is very important since these techniques are currently used to provide data for international exchange. However, such a simple comparison can lead to a misinterpretation of the mean differences because the degree of smoothing used with the USSR(standard) technique is much different than that used with the US(standard) technique. If it is assumed that the temperature profile will remain largely unchanged during the period of the comparison, a bias may arise which is caused by the different height resolutions of the techniques applied. This will obviously give rise to somewhat different values of the adjustments

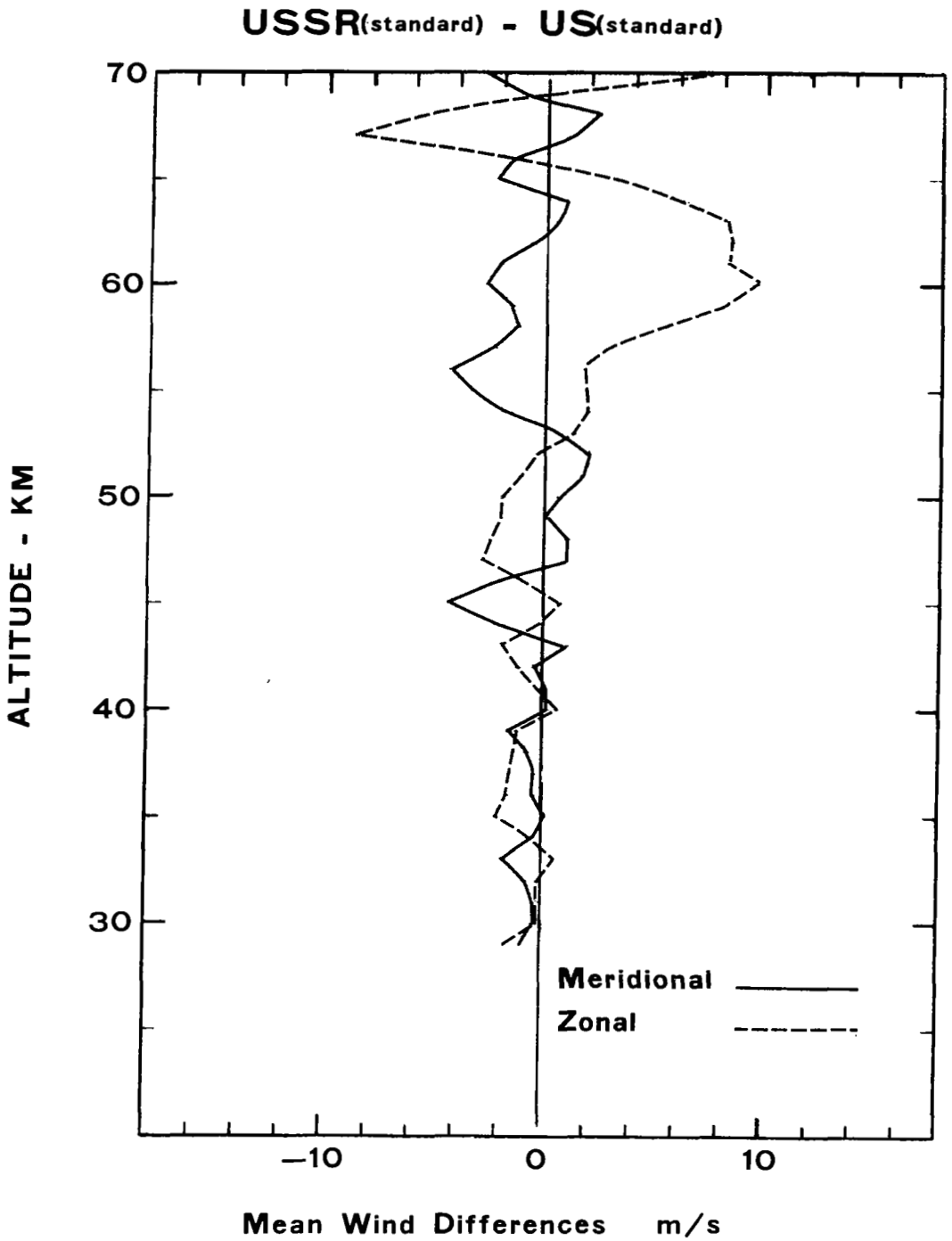

Figure 13. Mean of the differences component winds obtained from the US(standard) and USSR(standard) techniques.

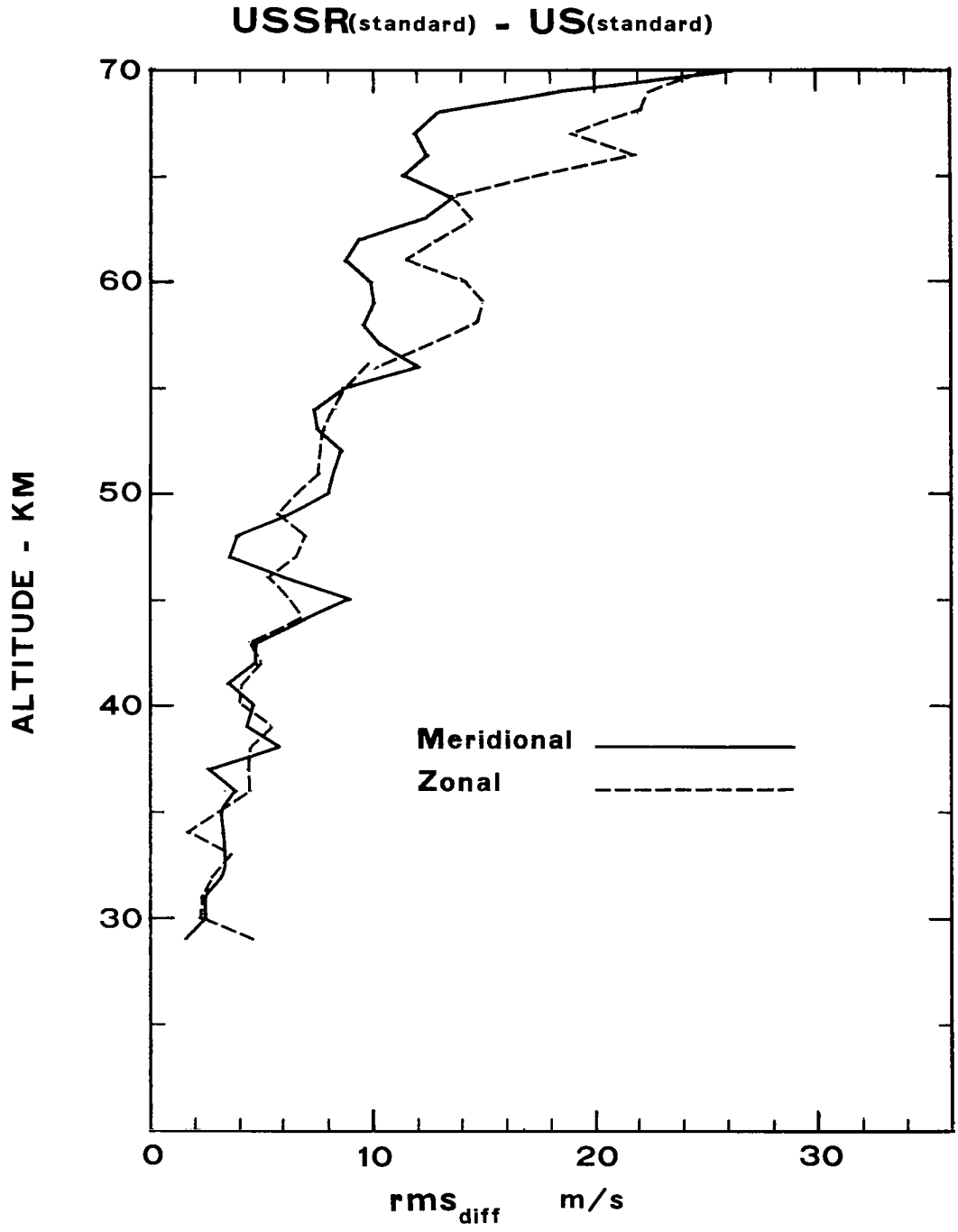

Figure 14. Root-Mean-Square differences (rms_{diff}) of the component winds obtained from the US(standard) and USSR(standard) techniques.

TABLE 8. MEAN OF THE DIFFERENCES Δ( ), AND ROOT-MEAN-SQUARE DIFFERENCES (rms_{diff}) FOR THE USSR(PROSPECTIVE) METHOD MINUS THE US(STANDARD) METHOD.

Altitude	Temperature (°C)						Wind				
	day			night			Meridional (mps)			Zonal (mps)	
km	n	$\overline{\Delta T_d}$	RMSD	n	$\overline{\Delta T_n}$	RMSD	n	$\overline{\Delta(N-S)}$	RMSD	$\overline{\Delta(E-W)}$	RMSD
70	5	-7.8	12.5	4	-10.5	11.4	6	-8.7	29.3	10.3	24.3
69	6	-8.8	14.3	6	-11.2	12.7	7	-5.0	21.0	6.0	21.7
68	7	-6.9	14.9	7	-14.4	15.8	9	-4.0	15.9	0.4	20.1
67	8	-9.0	16.2	8	-15.0	16.4	10	-2.3	13.3	-1.5	17.7
66	8	-10.6	17.4	8	-16.8	19.2	11	-3.3	11.7	2.7	17.7
65	8	-10.4	16.2	9	-13.4	14.6	13	-4.2	10.0	7.2	15.4
64	8	-10.1	15.2	9	-10.8	13.0	15	-1.1	12.2	9.1	14.3
63	9	-10.3	13.9	9	-10.2	12.1	16	-0.9	11.4	9.9	15.4
62	9	-10.4	12.7	9	-10.2	11.7	16	-2.1	9.8	8.1	12.4
61	9	-10.6	12.0	9	-9.8	11.1	16	-3.9	8.8	7.3	10.6
60	9	-10.1	11.0	9	-10.2	11.2	19	-4.7	10.9	9.7	14.3
59	9	-10.1	11.1	9	-9.1	10.1	19	-2.6	9.9	7.8	15.0
58	9	-8.8	9.9	9	-7.2	9.1	19	-0.8	8.3	4.7	14.8
57	9	-8.3	10.3	9	-5.9	8.7	19	-1.7	7.0	1.7	13.2
56	9	-7.2	9.1	9	-5.1	7.9	19	-3.6	8.4	1.1	10.9
55	9	-6.1	7.4	9	-5.8	7.5	19	-3.8	9.7	1.6	7.9
54	10	-4.5	5.2	9	-5.1	6.2	20	-2.0	7.1	2.3	6.1
53	10	-5.7	7.1	9	-3.8	5.4	20	0.7	7.2	1.8	5.6
52	10	-5.1	6.7	9	-3.6	5.3	20	1.7	7.0	0.2	4.8
51	10	-5.1	5.9	10	-1.8	5.4	20	1.6	7.3	-1.6	5.7
50	10	-4.1	5.9	10	-0.7	4.4	20	-0.1	7.6	-2.9	5.5
49	10	-3.9	5.5	10	-0.6	2.6	20	-0.5	6.8	-3.0	5.1
48	10	-3.2	4.6	10	-1.8	3.0	20	-0.1	4.6	-2.3	5.6
47	10	-4.0	5.9	10	-1.9	3.3	20	0.1	3.2	-2.0	5.8
46	10	-3.8	5.3	10	-2.1	2.9	20	-1.5	5.1	-1.5	5.4
45	10	-2.8	4.5	10	-3.1	3.9	20	-3.3	6.7	-0.6	5.1
44	10	-2.1	4.1	10	-3.1	4.5	20	-2.9	6.4	-0.3	5.5
43	10	-1.1	3.6	10	-1.6	5.5	20	-0.6	4.3	-1.3	4.5
42	10	-0.7	3.4	10	-1.6	4.2	20	-0.1	2.9	-1.2	2.8
41	10	-0.5	2.6	10	-2.3	3.8	20	0.5	3.2	-0.7	3.4
40	10	-0.6	2.2	10	-1.2	3.5	20	-0.3	3.4	-0.5	2.9
39	10	-1.7	3.5	10	-0.8	2.7	20	-1.0	3.2	-1.2	3.4
38	10	-1.2	3.0	10	0.9	1.9	20	-1.2	3.8	-1.9	3.6
37	10	-0.5	2.5	10	1.6	2.2	20	-0.9	2.2	-1.9	3.8
36	10	0.3	2.5	10	1.6	1.8	20	-0.9	3.2	-1.8	3.5
35	10	0.3	3.2	10	1.2	1.8	20	-0.5	3.1	-1.9	2.5
34	10	1.1	3.2	10	1.2	1.8	20	-0.7	2.8	-1.0	1.4
33	10	1.4	2.8	10	1.6	2.4	20	-1.9	3.3	-0.2	3.9
32	10	1.3	2.7	10	1.1	2.8	20	-1.2	2.9	-0.6	2.6
31	10	1.9	2.8	10	1.4	2.6	20	-0.8	2.1	-0.8	3.1
30	9	1.3	2.7	10	2.1	3.2	19	-0.7	2.7	-0.6	2.3
29	9	0.1	3.1	10	1.7	3.0	19	-0.3	6.5	-0.2	6.1
28	9	2.2	3.3	9	2.9	3.4	18	-0.9	2.9	-0.7	1.6
27	9	2.7	3.4	9	2.4	3.1	18	-1.1	2.2	-0.8	2.4
26	9	2.6	3.1	9	1.7	2.5	18	-0.9	2.8	-0.6	2.4
25	9	2.6	3.9	8	1.3	2.4	16	-0.6	2.7	-0.2	2.4
24	5	2.0	3.6	4	1.5	2.1	9	-1.4	2.4	-0.4	2.3

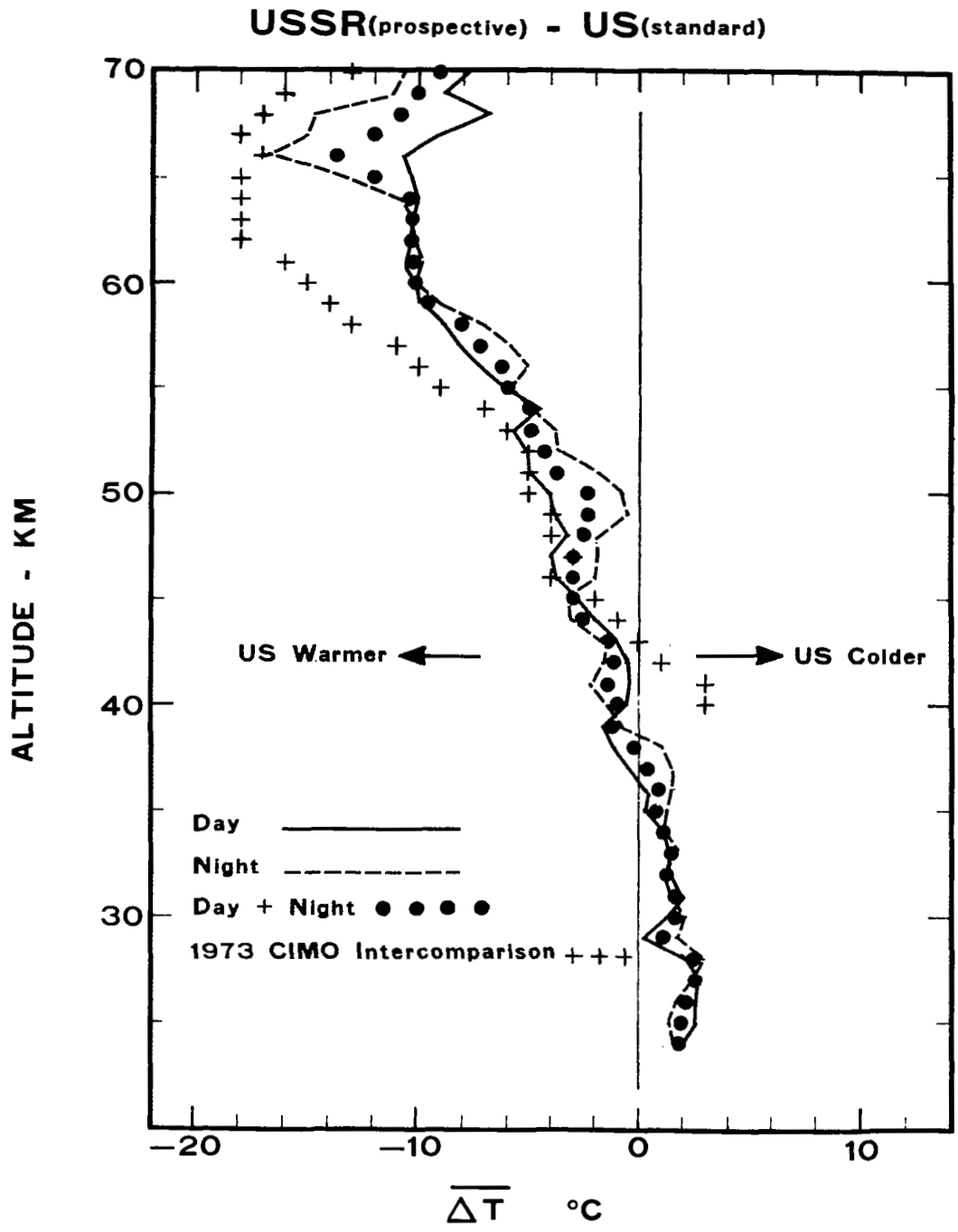

Figure 15. Profiles showing the mean of the differences of the measured temperature (ΔT) obtained from the US(standard) and USSR(prospective) techniques for daytime and nighttime and a comparison of the results obtained from the 1973 CIMO-sponsored intercomparison with the present data.

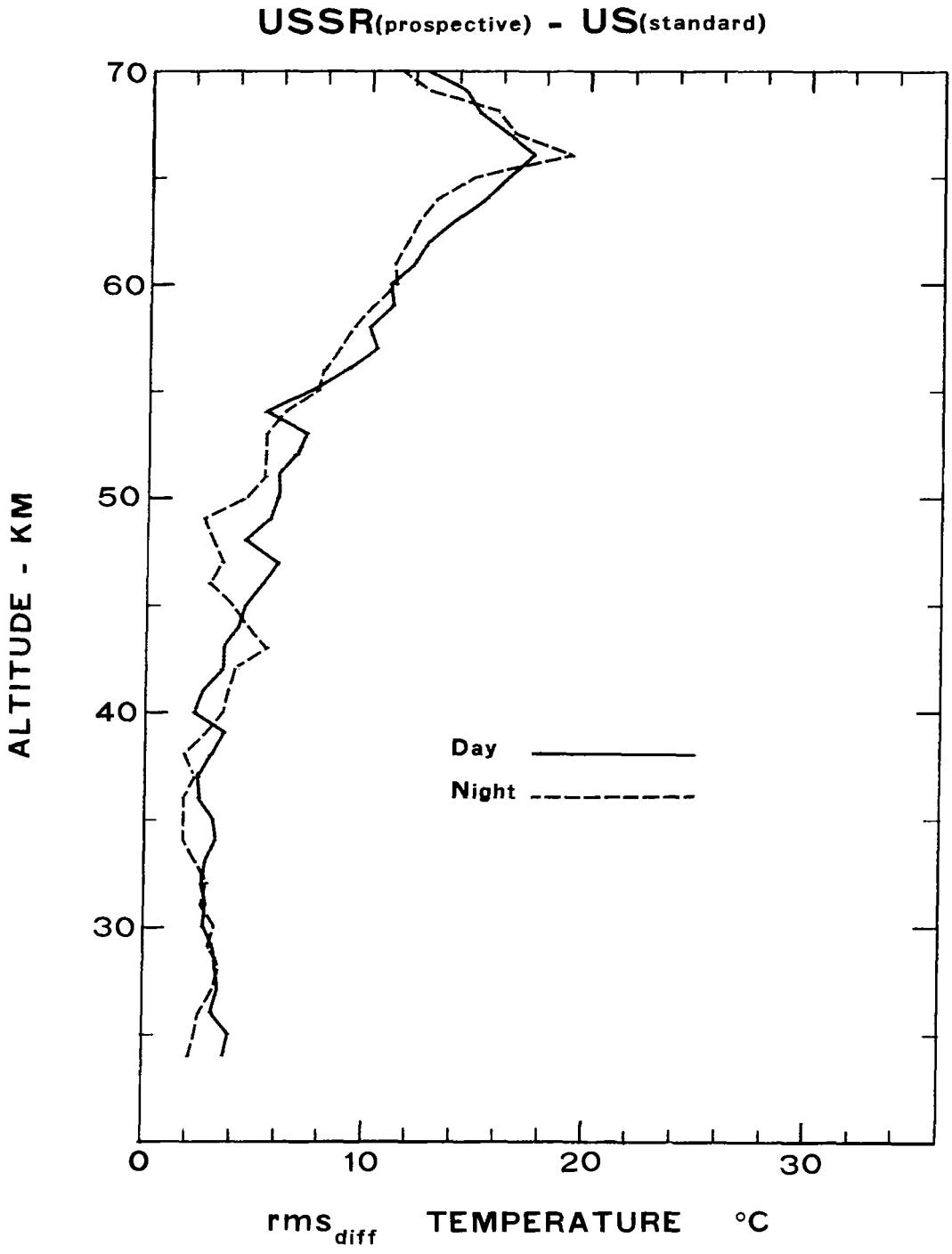

Figure 16. Root-Mean-Square differences (rms(diff)) of the temperatures obtained from the US(standard) and USSR(prospective) techniques during day and night.

for the USSR(prospective) technique as well, since a higher sample rate and greater smoothing is used. It is possible also that discrepancies found for the US(standard) technique vs the USSR(prospective) technique are of some importance as well for the adjustment of data obtained in the past using the standard techniques. Since the smoothing applied to either system should fit the vertical response capability of the measurement this possibility for achieving compatible results should be examined further. For example, it is possible to smooth Datasonde data to the M100B standard data level and then to compare the profiles.

The mean difference of the component winds is relatively small below about 58 kilometers. Analysis of the measurement differences in the wind components, Figure 17, indicate that differences, in the mean, exist above the 58 km layer. Again the rms_{diff} for both components, Figure 18, indicate rapidly increasing variability in the measurements above about 56 km. It appears that the wind differences between the US(standard) and USSR (prospective) are less than those obtained when comparing the US(standard) and USSR(standard) techniques.

The complete data set is available in Appendix B, additional computations and analyses of these data may be of interest. This may be especially true, when the prospective method is finally used at all USSR rocketsonde sites.

Intercomparison with Spheres

Part of the intercomparison plan included six US Super-Loki Spheres to be launched in conjunction with the Datasondes and M100B. The dates and times of the launchings are given in Table 3. It should be noted that three spheres were launched during daytime and three during night. However, the comparison uses the data from the six spheres in order to provide a larger sample. Data listings, differences, and plots are given in Appendixes C, D, and E, for the US(Sphere) vs US(standard), US(Sphere) vs USSR(standard), and US(Sphere) vs USSR(prospective) techniques, respectively. The figures which follow present plots of the mean of the differences in the temperature and wind data and the root-mean-square differences.

Figure 19, the mean difference of the temperatures, represents the three techniques: USSR(standard) minus US(Sphere), USSR(prospective) minus US(Sphere), and US(standard) minus US(Sphere). It is obvious that the comparison of both USSR techniques with the US(sphere) technique reveals differences which are quite similar. Large differences between the sphere and M100B occur above 60 km but cannot be explained at this time. Below 60 km the sphere derived temperatures and the USSR temperatures agree to within 8°C. Generally agreement of the US(Sphere) and US(standard) techniques are less than 6°C below 66 km. This figure tends to point out that above about 65 km a large discrepancy in the

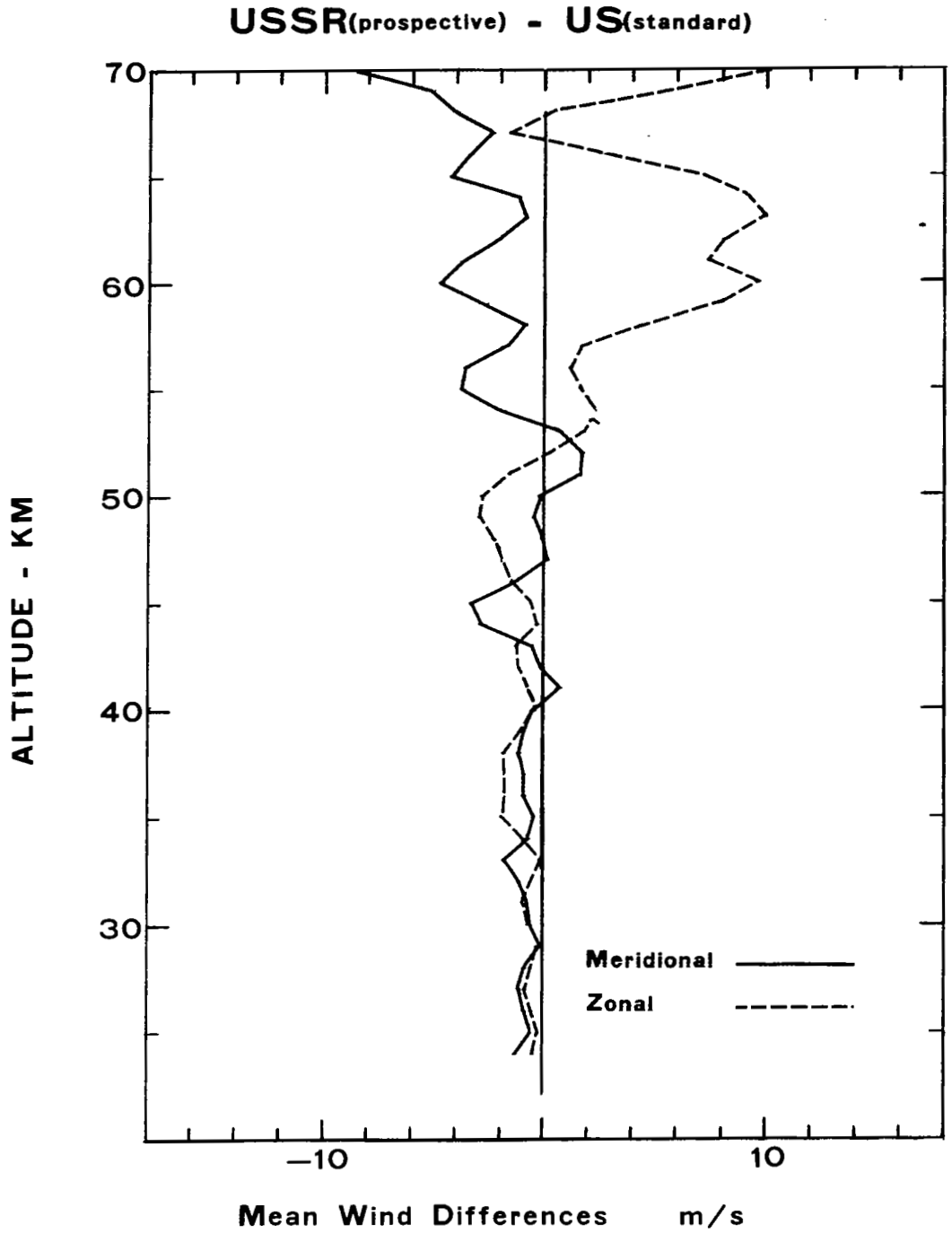

Figure 17. Mean of the differences component winds obtained from the US(standard) and USSR(prospective) techniques.

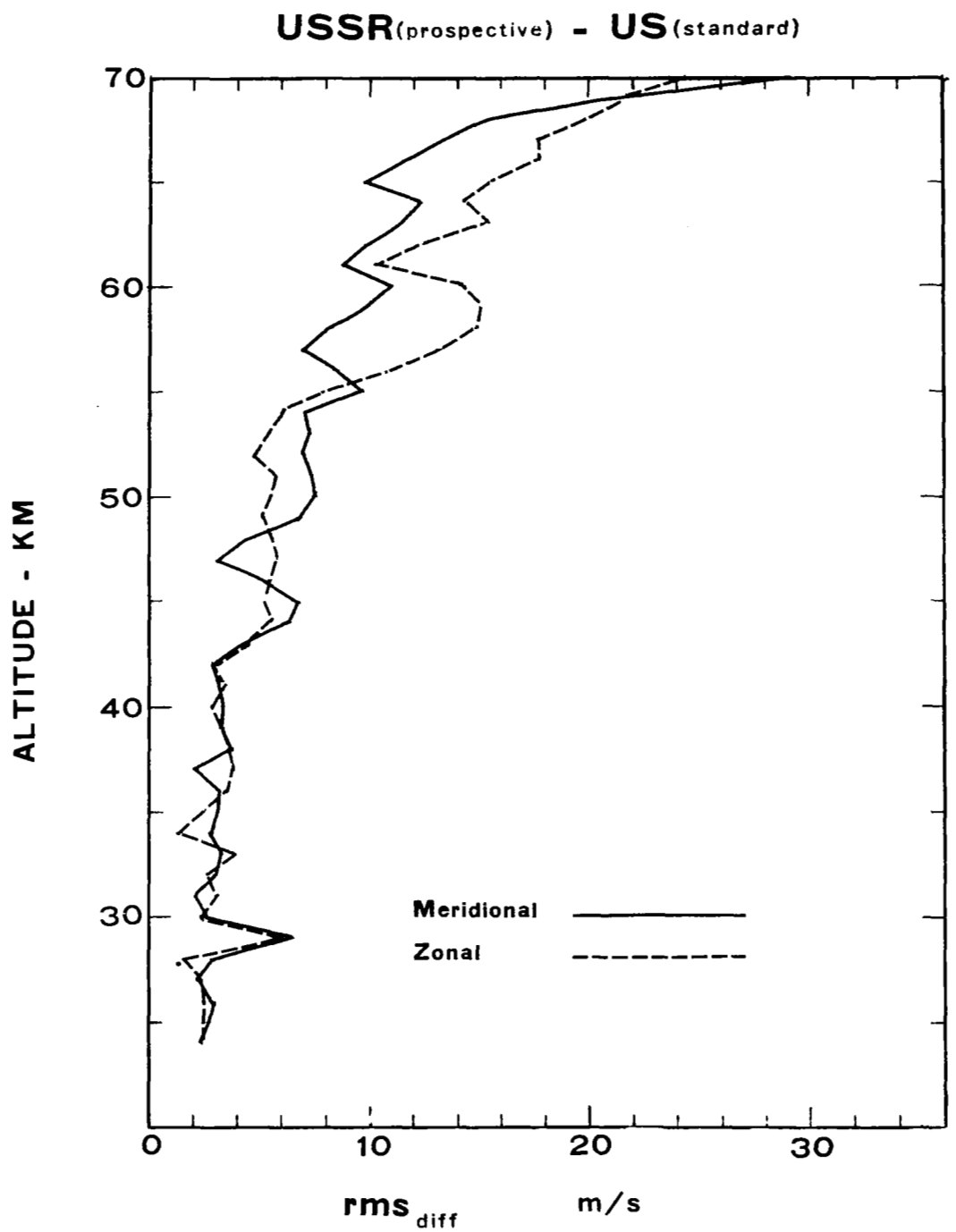

Figure 18. Root-Mean-Square differences (rms_{diff}) of the component winds obtained from the US(standard) and USSR(prospective) techniques.

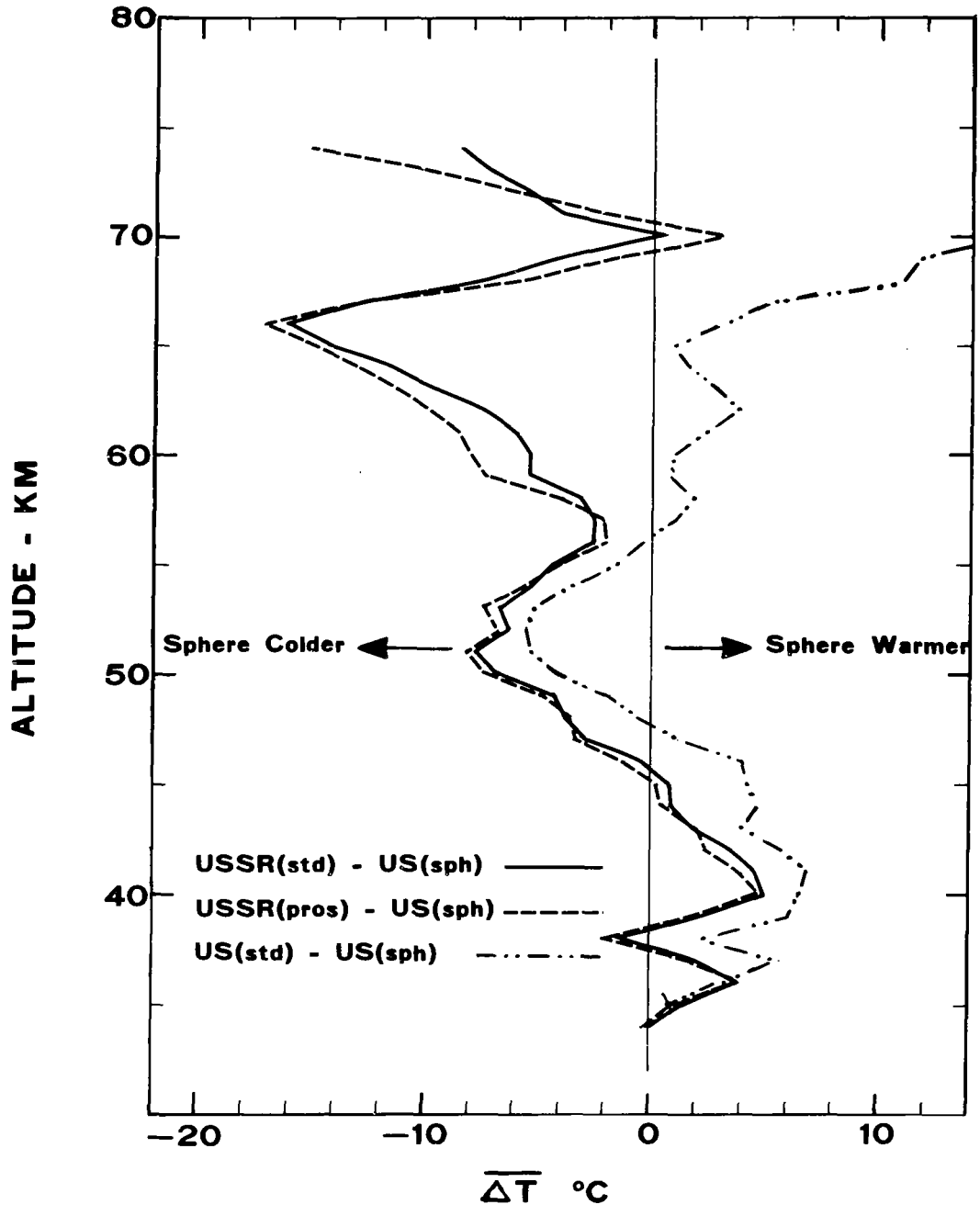

Figure 19. Profiles showing the mean of the differences of the measured temperatures (ΔT) obtained from the US(sphere technique and the US(standard), USSR(standard), and USSR(prospective) techniques.

measurements exists. Since the completion of the intercomparison, additional work has been done on the falling sphere technique, and the bias found in the area of the stratopause, has been reduced considerably, but additional sphere and Datasonde comparisons are now necessary. Figure 20 suggests that the variability encountered may be coming from the sphere measurements; however, the small sample size can not be overlooked as a possible cause for the large variability.

Comparison of the wind components indicates that large differences in the mean meridional wind exist above 64 km, Figure 21, but below this altitude winds derived from both USSR techniques and the US technique agree quite well with winds derived from the spheres. The root-mean-square differences, Figure 22, in the meridional wind between the sphere and USSR techniques are quite similar, however smaller root-mean-square differences were noted to exist between the sphere and US(standard) technique. This is consistent with the results for the zonal component root-mean-square differences shown in Figure 24. Differences in the mean zonal wind, Figure 23, are less than 6 ms^{-1} below 61 km for both the USSR techniques vs the US(Sphere) and are less than 6 ms^{-1} below 66 km for the US(Sphere) vs US(standard) techniques.

CONCLUSIONS AND RECOMMENDATIONS

The intercomparison test conducted in 1977, offshore Wallops Flight Center, between the US and USSR, was successfully concluded. The launch sequence, except for minor schedule changes, followed the experimental design quite well. It was planned to launch 22 pairs of rocketsonde instruments, each pair to consist of a US Datasonde and a USSR M100B rocketsonde instrument. These 22 pair were split with half being launched during day and half during night. The results obtained were extraordinarily good. Twenty pairs of temperature data and 21 pairs of wind data were obtained, however, 22 pairs were successfully launched. The difference between those data pairs evaluated and the actual number launched is primarily due to altitudes that do not overlap in each case.

The results of the temperature comparison are very encouraging. American and Soviet temperature data, obtained using the standard techniques, agree in the mean to within 6°C to about 60 km altitude. However, the rms_{diff} is larger, being about ±8°C at 60 km. The agreement in temperature measurement when using the USSR(prospective) technique is slightly worse. Wind data comparisons obtained using the US(standard) and USSR(prospective) technique is better than that obtained when using the USSR(standard) technique. Nevertheless, agreement within 3 ms^{-1} is possible to 57 km, but wind data agreement to higher altitudes could be considered acceptable. Overall, the results of the 1977 comparison provides considerably more confidence in the joint use of the two data sets than

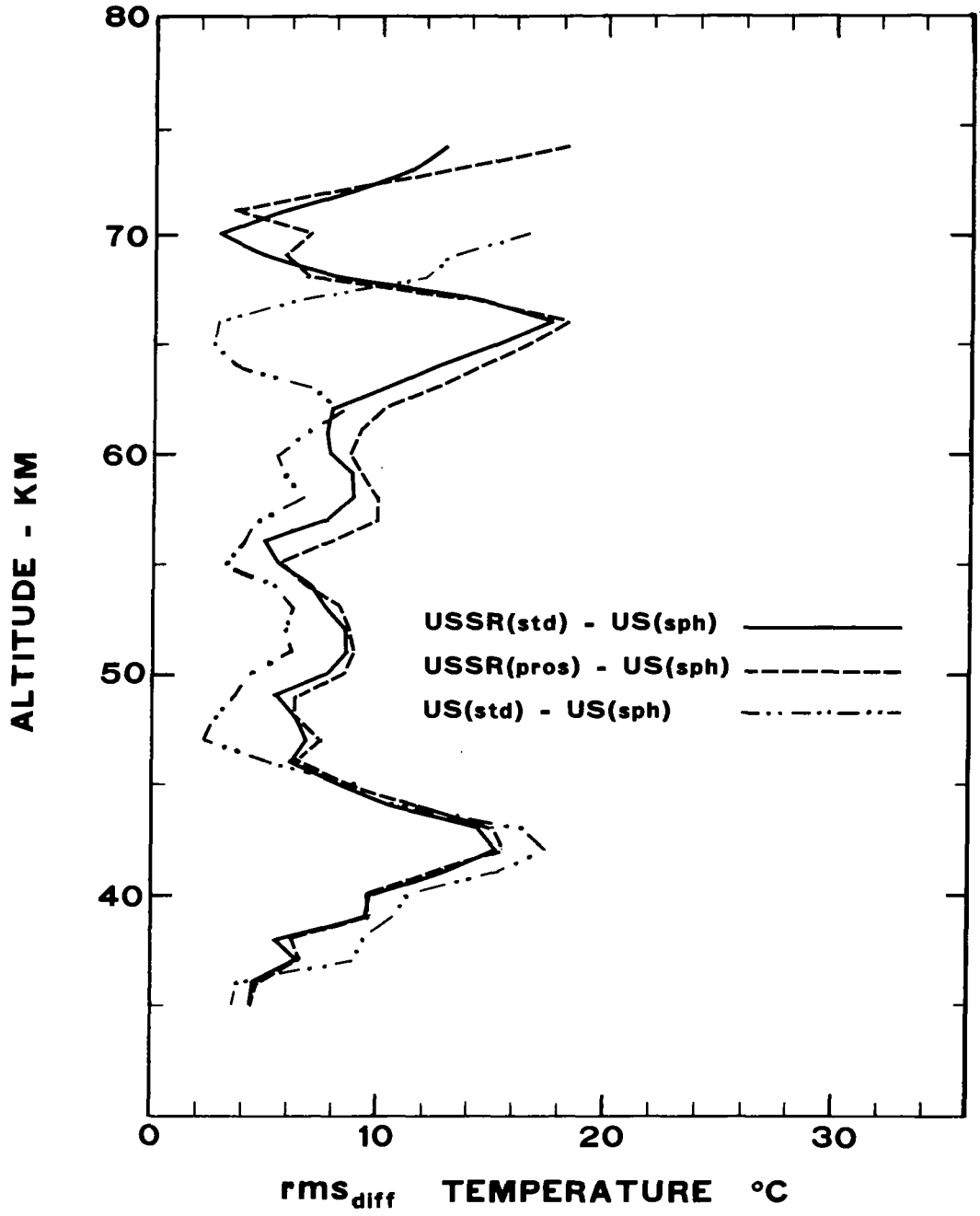

Figure 20. Root-Mean-Square differences (rms_{diff}) of the temperatures obtained from the US(sphere) technique and the US(standard), USSR(standard), and the USSR(prospective) techniques.

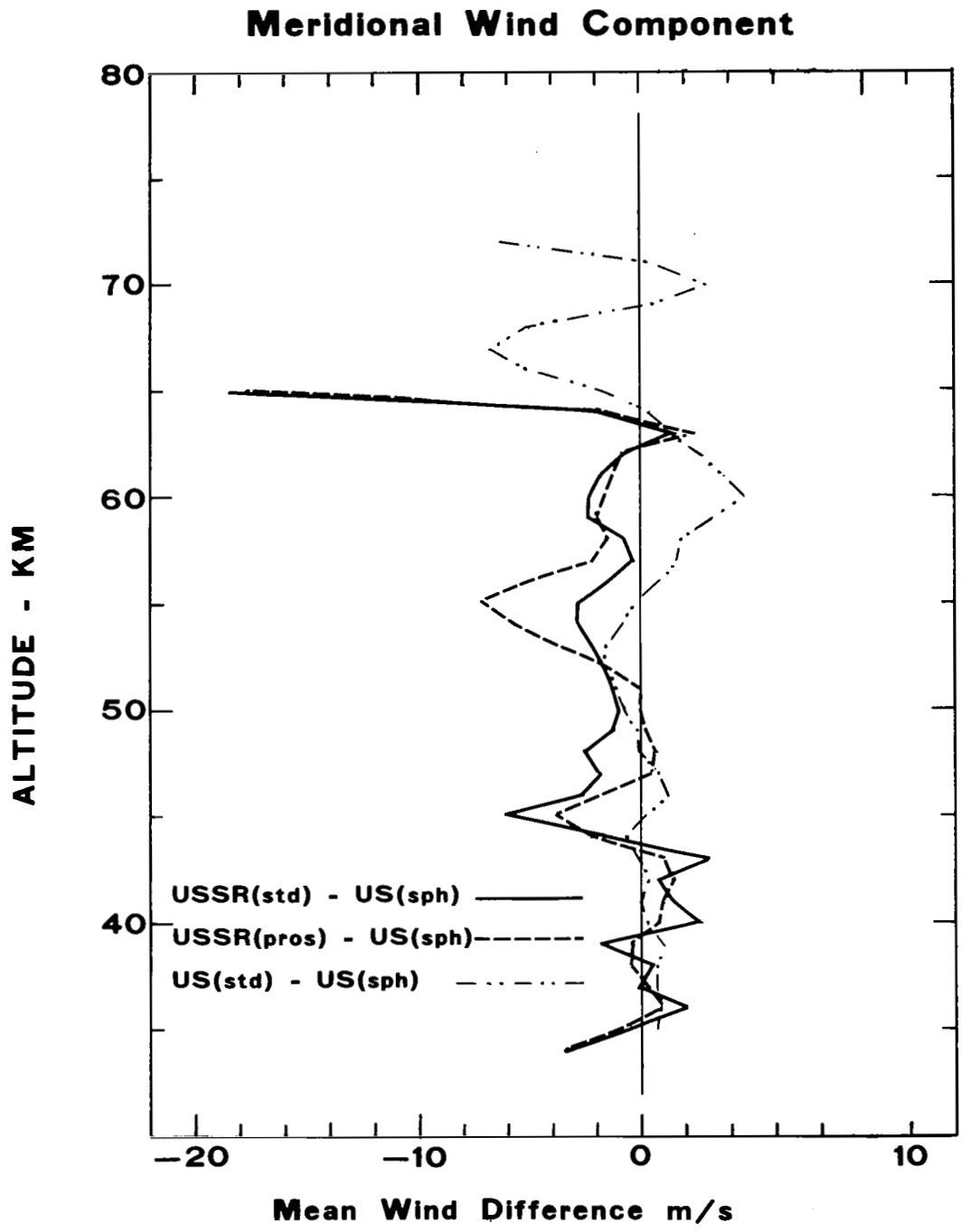

Figure 21. Mean of the differences of the meridional wind components obtained from the US(sphere) technique and the US(standard), USSR(standard), and USSR(prospective) techniques.

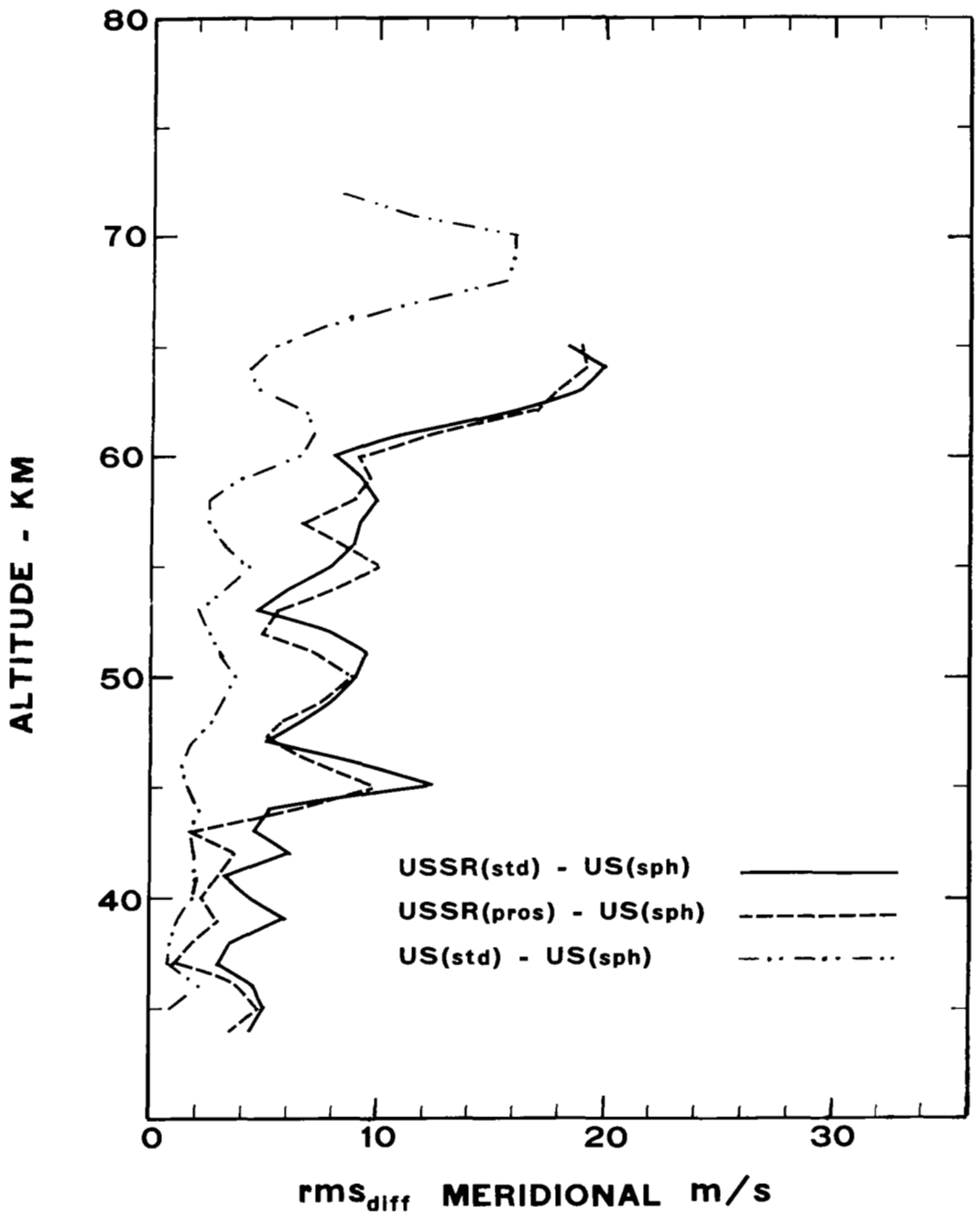

Figure 22. Root-Mean-Square differences (rms_{diff}) of the meridional wind component obtained from the US(sphere) technique and the US(standard), USSR(standard), and USSR(prospective) techniques.

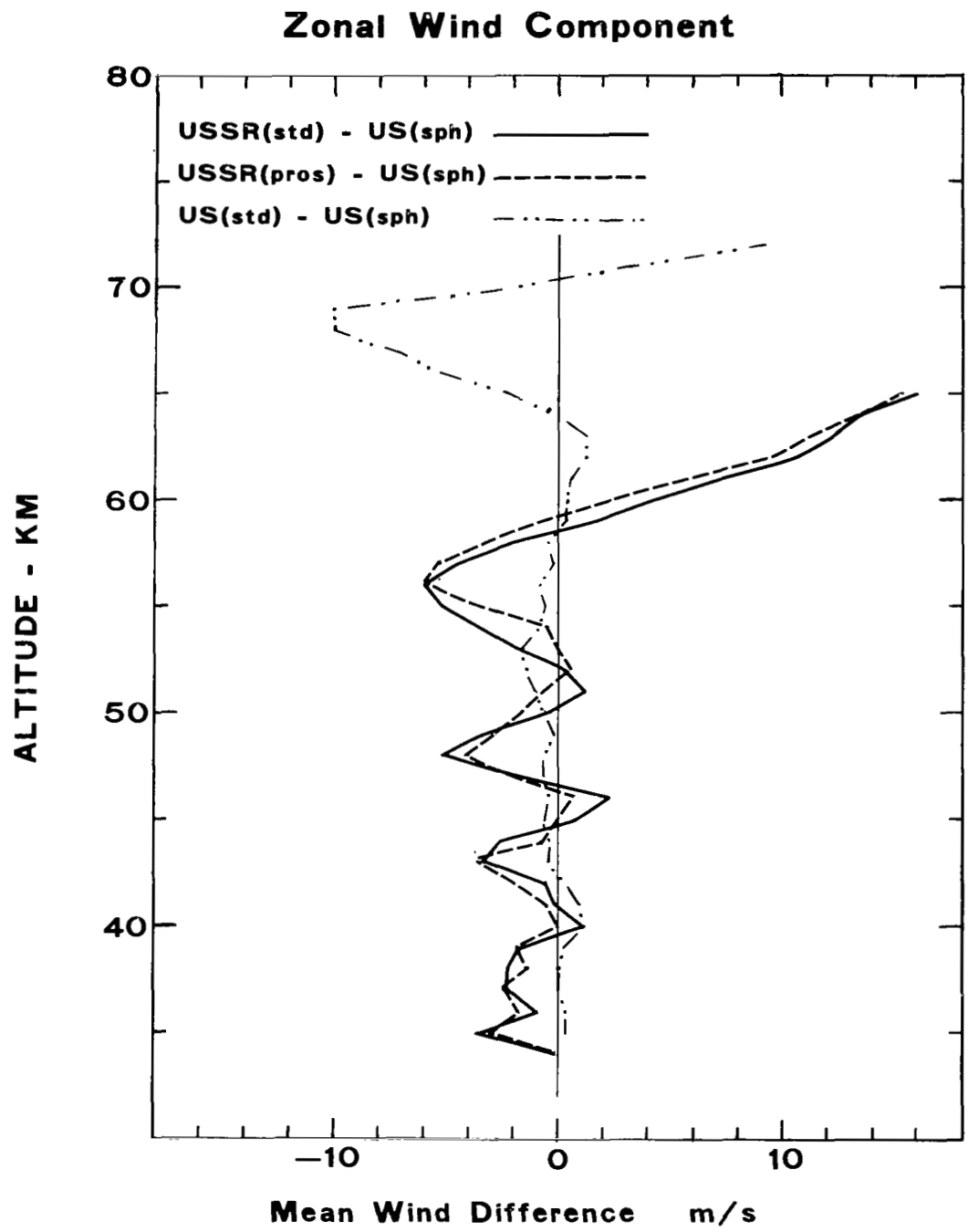

Figure 23. Mean of the differences of the zonal wind components obtained from the US(sphere) technique and the US(standard), USSR(standard), and USSR(prospective) techniques.

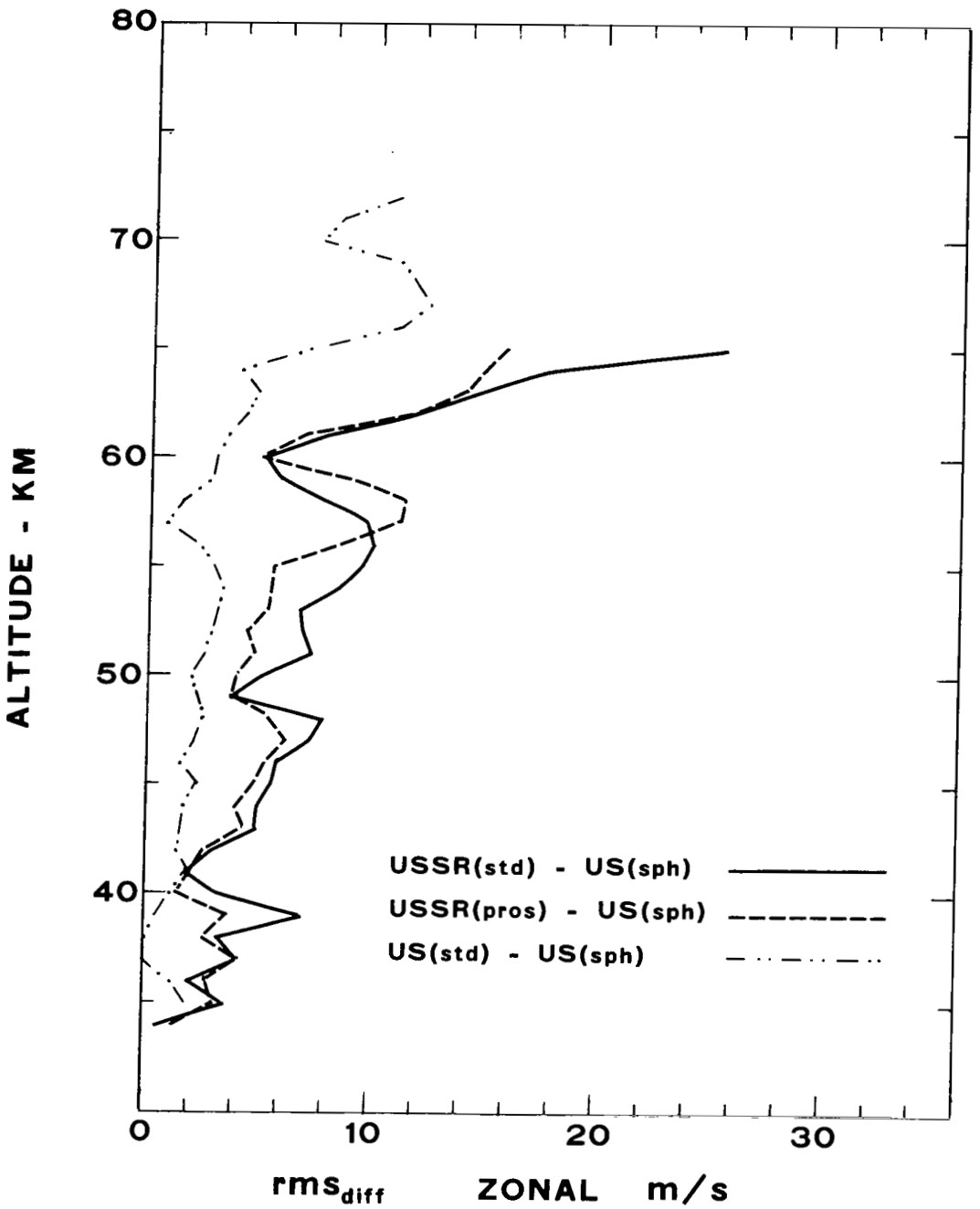

Figure 24. Root-Mean-Square differences (rms_{diff}) of the zonal wind component obtained from the US(sphere) technique and the US(standard), USSR(standard), and USSR(prospective) techniques.

was possible after the 1973 intercomparison.

Comparison of the standard techniques with the falling sphere technique creates questions which will not be answered in this report. We find that the sphere derived temperature and, especially the winds, are in reasonable agreement below 66 km with the US(standard) technique. But this is to be expected since development of the sphere and Datasonde reduction results must be consistent with each other if either or both of these techniques are used jointly as is often the case in the United States. Nevertheless, the intercomparison results do suggest that additional investigation of the sphere compared to the standard technique is highly desirable.

Based on the results obtained from this intercomparison it is concluded that temperatures obtained with the USSR(standard) technique are in reasonable agreement (less than 4°C) up to 58 km, while temperatures obtained with the USSR(prospective) technique are only reasonable to 52 km. It is recommended that additional effort be undertaken to identify why the new technique does not provide as good agreement as the standard technique. It is clear that even the root-mean-square differences obtained between the US (standard) and USSR(prospective) begin to grow large at a much lower altitude than those obtained using standard techniques.

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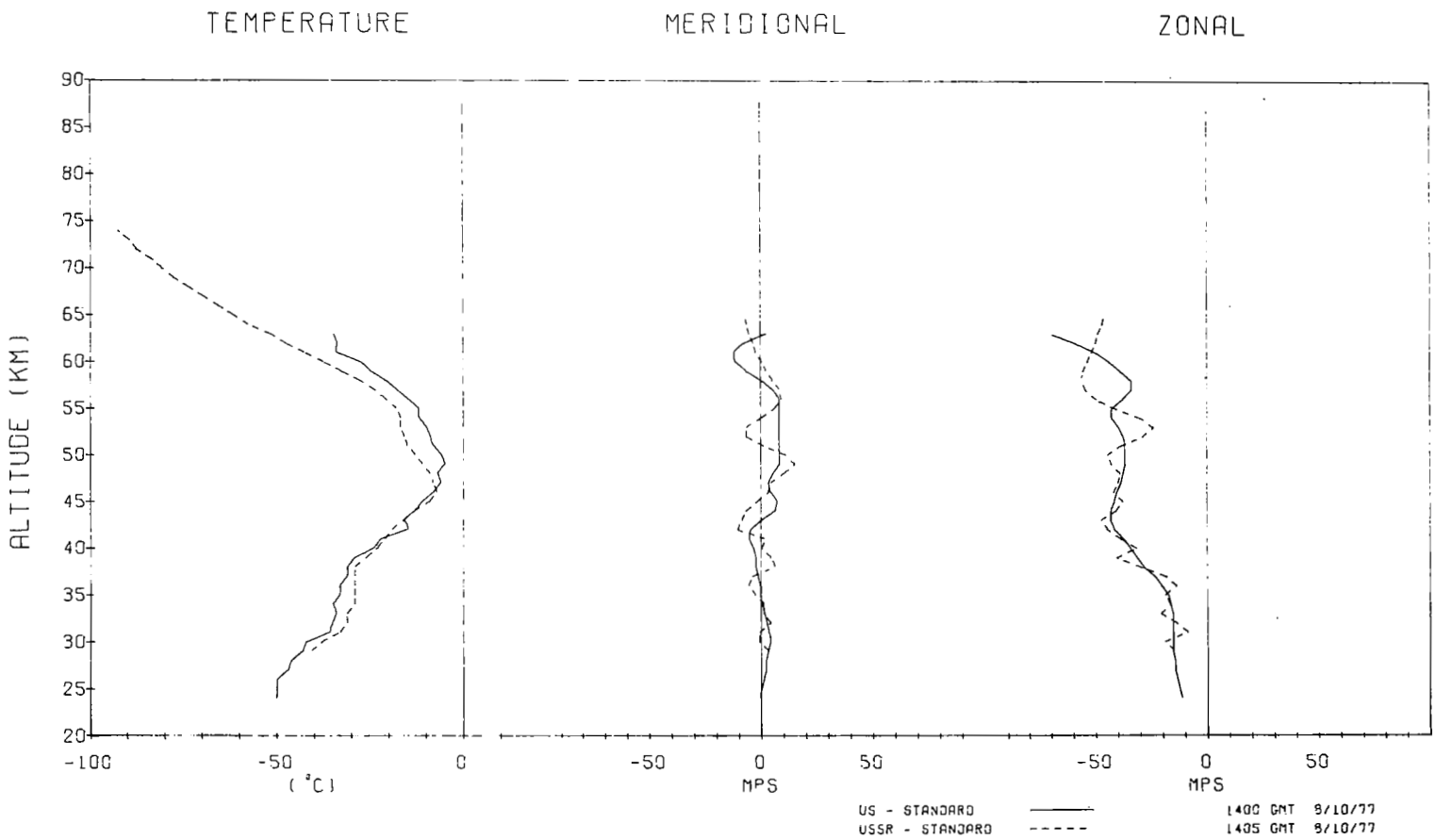
APPENDIX A

LISTINGS AND PLOTS OF US(STANDARD) AND USSR(STANDARD) DATA

This appendix contains listings of the rocketsonde data obtained using the US(standard) and the USSR(standard) data reduction techniques. The differences (USSR-US) in the temperature and wind data are listed in their corresponding places. At altitudes where data are not available a group of nines (999) are entered. The plots, shown on the pages facing the tabulated data, are for convenience, and enhances individual pair comparison.

ALT	US - STANDARD AUG 10 1977 1400 GMT			USSR - STANDARD AUG 10 1977 1405 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
74	999	999	999	-93	999	999			
73	999	999	999	-90	999	999			
72	999	999	999	-88	999	999			
71	999	999	999	-84	999	999			
70	999	999	999	-81	999	999			
69	999	999	999	-78	999	999			
68	999	999	999	-74	999	999			
67	999	999	999	-70	999	999			
66	999	999	999	-66	999	999			
65	999	999	999	-62	-8	-46			
64	999	999	999	-58	-7	-47			
63	-35	2	-70	-52	-6	-49	-17	-8	21
62	-34	-8	-59	-48	-4	-50	-14	4	9
61	-34	-13	-50	-43	-3	-52	-9	10	-2
60	-28	-12	-44	-38	0	-54	-10	12	-10
59	-25	-7	-39	-33	2	-56	-8	9	-17
58	-21	0	-34	-28	5	-57	-7	5	-23
57	-18	5	-34	-24	8	-55	-6	3	-21
56	-15	8	-38	-21	9	-50	-6	1	-12
55	-12	8	-43	-18	6	-41	-6	-2	2
54	-12	8	-43	-17	0	-30	-5	-8	13
53	-10	8	-40	-17	-7	-24	-7	-15	16
52	-9	8	-38	-16	-7	-29	-7	-15	9
51	-8	8	-37	-15	1	-39	-7	-7	-2
50	-6	8	-37	-13	11	-45	-7	3	-8
49	-5	8	-37	-11	15	-43	-6	7	-6
48	-7	5	-38	-9	10	-39	-2	5	-1
47	-6	3	-39	-8	4	-40	-2	1	-1
46	-8	4	-41	-7	3	-42	1	-1	-1
45	-11	7	-42	-9	-2	-38	2	-9	4
44	-13	6	-44	-13	-7	-41	0	-13	3
43	-16	0	-44	-16	-9	-48	0	-9	-4
42	-15	-5	-42	-19	-11	-45	-4	-6	-3
41	-22	-6	-38	-21	2	-39	1	8	-1
40	-24	-4	-35	-23	0	-32	1	4	3
39	-29	-3	-32	-26	4	-41	3	7	-9
38	-31	-3	-29	-29	6	-30	2	9	-1
37	-31	-2	-24	-29	-4	-19	2	-2	5
36	-33	-1	-21	-29	-6	-14	4	-5	7
35	-33	-1	-18	-29	-3	-19	4	-2	-1
34	-35	0	-17	-29	1	-17	6	1	0
33	-34	1	-16	-31	1	-21	3	0	-5
32	-35	2	-16	-31	4	-14	4	2	2
31	-36	3	-16	-33	-1	-9	3	-4	7
30	-42	4	-16	-38	-1	-19	4	-5	-3
29	-43	3	-16	-41	3	-15	2	0	1
28	-46	2	-15	999	999	999			
27	-47	2	-15	999	999	999			
26	-50	1	-14	999	999	999			
25	-50	0	-13	999	999	999			
24	-50	-1	-12	999	999	999			


TEMPERATURE
MERIDIONAL
ZONAL
ALTITUDE (KM)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
-100
-50
0
(°C)
-50
0
50
MPS
-50
0
50
MPS
US - STANDARD
USSR - STANDARD
1400 GMT 9/10/77
1405 GMT 9/10/77

ALT	US - STANDARD AUG 12 1977 0419 GMT			USSR - STANDARD AUG 12 1977 0405 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS -1 M S		TEMP	COMPONENT WINDS -1 M S		TEMP	COMPONENT WINDS -1 M S	
KM	DEG C	NS	EW	DEG C	NS	EW	DEG C	NS	EW
67	-54	-19	-67	999	999	999			
66	-52	-25	-56	999	999	999			
65	-52	-24	-45	999	999	999			
64	-52	-17	-36	999	999	999			
63	-44	-13	-34	999	999	999			
62	-37	-12	-35	999	999	999			
61	-30	-13	-36	999	999	999			
60	-26	-16	-34	999	999	999			
59	-28	-21	-33	999	999	999			
58	-24	-24	-32	999	999	999			
57	-18	-21	-34	999	999	999			
56	-16	-14	-37	999	999	999			
55	-12	-10	-40	999	999	999			
54	-6	-9	-44	999	999	999			
53	-6	-7	-46	999	999	999			
52	-8	-4	-47	999	999	999			
51	-8	-2	-48	999	999	999			
50	-7	-5	-46	-11	0	-52	-4	5	-6
49	-12	-9	-43	-14	-2	-50	-2	7	-7
48	-12	-11	-40	-14	-5	-45	-2	6	-5
47	-11	-10	-38	-15	-8	-39	-4	2	-1
46	-13	-5	-35	-17	-7	-30	-4	-2	5
45	-16	-1	-29	-16	-1	-22	0	0	7
44	-15	2	-23	-12	4	-19	3	2	4
43	-14	1	-22	-9	3	-18	5	2	4
42	-14	-2	-25	-9	-1	-21	5	1	4
41	-17	-4	-29	-12	-3	-26	5	1	3
40	-20	-5	-30	-14	-3	-28	6	2	2
39	-22	-2	-30	-20	-2	-30	2	0	0
38	-25	0	-30	-25	-2	-37	0	-2	-7
37	-27	0	-30	-26	-1	-37	1	-1	-7
36	-28	-1	-29	-27	-3	-33	1	-2	-4
35	-32	-2	-28	-30	-4	-30	2	-2	-2
34	-37	-2	-26	-33	3	-26	4	5	0
33	-38	-1	-24	-35	-2	-26	3	-1	-2
32	-38	1	-23	-37	-2	-23	1	-3	0
31	-41	1	-22	-39	1	-22	2	0	0
30	-42	1	-20	-35	-4	-17	7	-5	3
29	-43	0	-18	-37	-2	-14	6	-2	4
28	-47	1	-16	-40	-5	-18	7	-6	-2
27	-49	1	-14	-42	3	-17	7	2	-3
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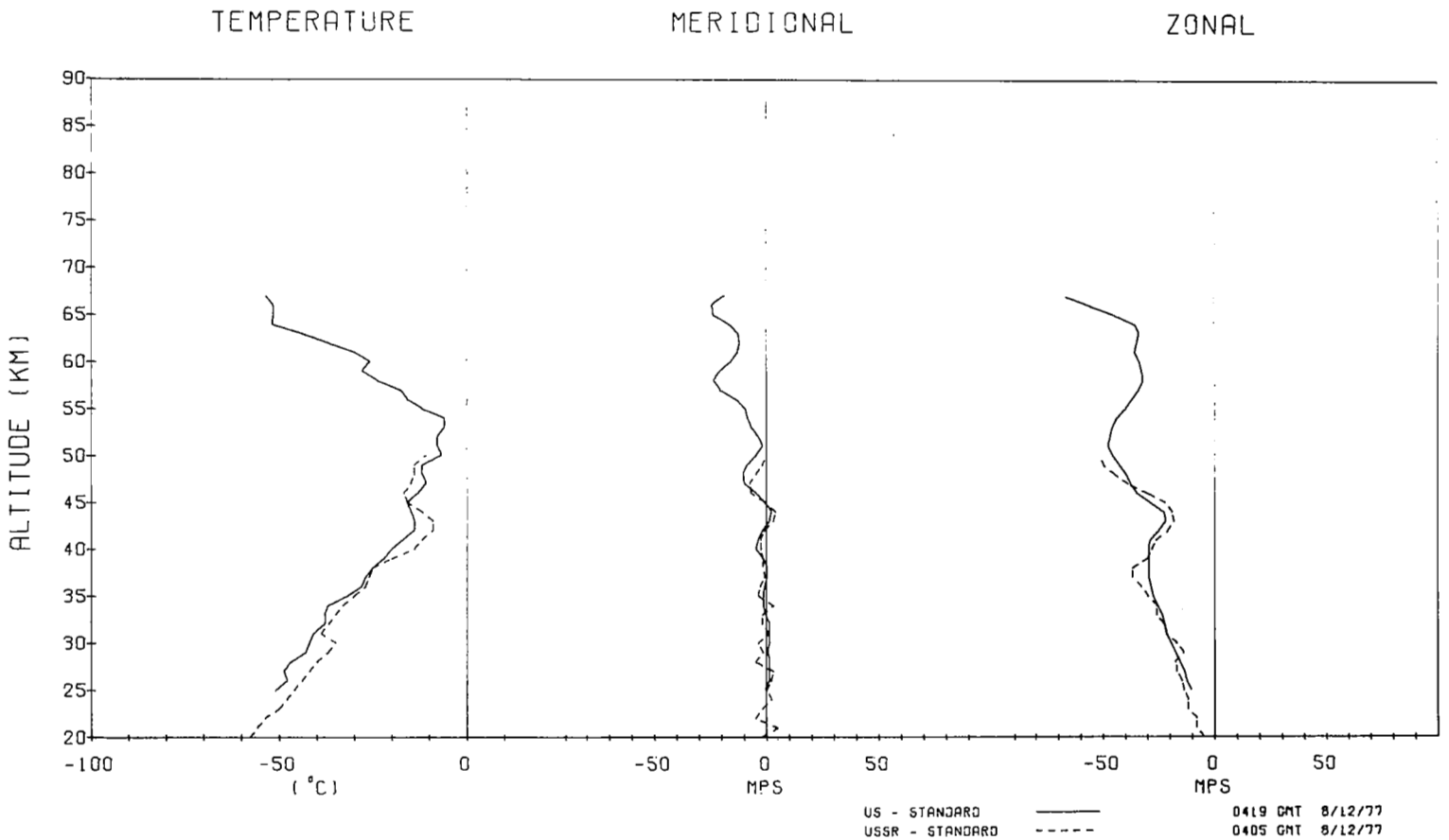
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-100
-50
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(°C)
-50
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50
MPS
-50
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MPS
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USSR - STANDARD
0419 GMT 8/12/77
0405 GMT 8/12/77

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	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
76	999	999	999	-78	999	999			
75	999	999	999	-75	999	999			
74	999	999	999	-71	999	999			
73	999	999	999	-68	999	999			
72	999	999	999	-65	999	999			
71	999	999	999	-62	999	999			
70	-48	-1	-29	-60	999	999	-12		
69	-50	1	-39	-58	999	999	-8		
68	-49	-3	-50	-56	999	999	-7		
67	-51	-14	-58	-55	999	999	-4		
66	-54	-24	-61	-54	999	999	0		
65	-50	-29	-61	-53	999	999	-3		
64	-45	-28	-60	-52	999	999	-7		
63	-42	-26	-59	-50	999	999	-8		
62	-42	-26	-56	-48	999	999	-6		
61	-40	-27	-51	-45	999	999	-5		
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58	-31	-13	-40	-34	-7	-27	-3	6	13
57	-26	-6	-39	-29	-6	-30	-3	0	9
56	-22	-4	-41	-24	-6	-32	-2	-2	9
55	-17	-4	-42	-19	-7	-34	-2	-3	8
54	-13	-7	-42	-15	-8	-34	-2	-1	8
53	-11	-9	-40	-11	-10	-33	0	-1	7
52	-10	-7	-39	-8	-10	-32	2	-3	7
51	-9	-4	-39	-6	-10	-35	3	-6	4
50	-7	-3	-40	-5	-10	-39	2	-7	1
49	-5	-5	-41	-5	-10	-43	0	-5	-2
48	-5	-9	-40	-7	-11	-44	-2	-2	-4
47	-3	-9	-39	-9	-13	-46	-6	-4	-7
46	-10	-4	-38	-11	-14	-49	-1	-10	-11
45	-11	-1	-36	-13	-11	-48	-2	-10	-12
44	-10	0	-33	-14	-4	-39	-4	-4	-6
43	-10	0	-30	-14	4	-33	-4	4	-3
42	-12	1	-29	-14	3	-31	-2	2	-2
41	-15	2	-31	-18	1	-29	-3	-1	2
40	-20	2	-32	-23	-1	-29	-3	-3	3
39	-25	1	-30	-26	-2	-24	-1	-3	6
38	-29	1	-29	-27	7	-22	2	6	7
37	-31	0	-29	-27	-1	-29	4	-1	0
36	-33	-1	-29	-30	-11	-28	3	-10	1
35	-33	-2	-27	-32	-4	-33	1	-2	-6
34	-35	-1	-24	-34	-3	-23	1	-2	1
33	-39	-2	-21	-37	-7	-26	2	-5	-5
32	-39	-2	-19	-38	-6	-20	1	-4	-1
31	-41	-1	-18	-41	-1	-18	0	0	0
30	-41	0	-17	-40	1	-16	1	1	1
29	-41	1	-16	-40	-1	-19	1	-2	-3
28	-44	2	-15	999	999	999			
27	-47	2	-14	999	999	999			
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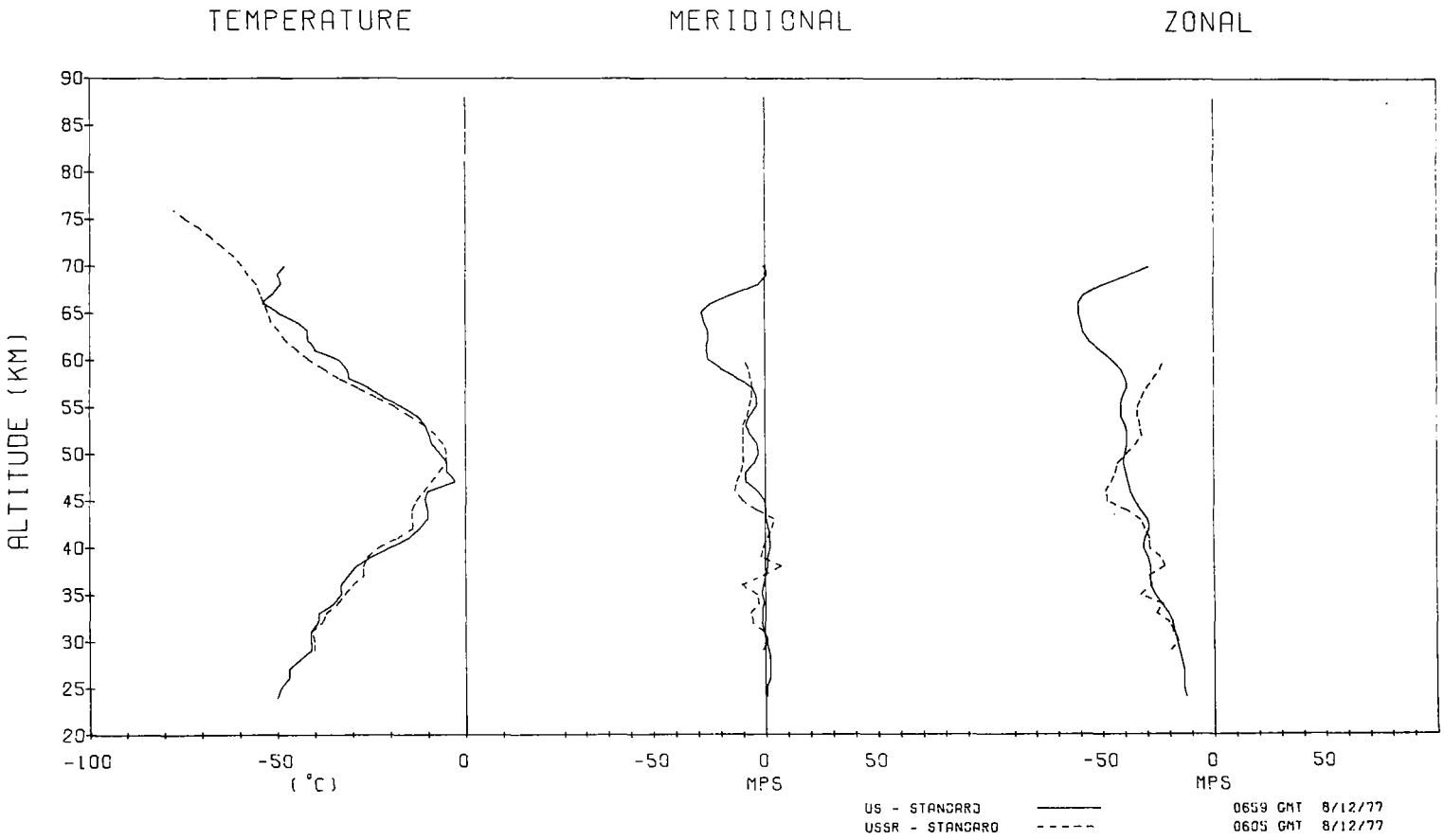
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(°C)
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MPS
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USSR - STANDARD
0659 GMT 8/12/77
0605 GMT 8/12/77

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	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
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73	999	999	999	-88	999	999			
72	999	999	999	-84	999	999			
71	999	999	999	-80	999	999			
70	999	999	999	-77	999	999			
69	999	999	999	-74	999	999			
68	999	999	999	-72	999	999			
67	-45	-1	-17	-69	999	999	-24		
66	-39	4	-24	-66	999	999	-27		
65	-39	8	-31	-62	999	999	-23		
64	-40	8	-39	-58	999	999	-18		
63	-37	6	-44	-54	999	999	-17		
62	-33	5	-47	-49	-4	-38	-16	-9	9
61	-29	6	-48	-43	-1	-42	-14	-7	6
60	-29	8	-47	-38	1	-44	-9	-7	3
59	-24	8	-44	-33	2	-44	-9	-6	0
58	-21	7	-40	-28	2	-43	-7	-5	-3
57	-18	9	-36	-24	0	-41	-6	-9	-5
56	-14	11	-36	-20	-2	-39	-6	-13	-3
55	-10	11	-39	-17	-3	-38	-7	-14	1
54	-9	6	-45	-15	-4	-39	-6	-10	6
53	-7	-2	-50	-13	-5	-41	-6	-3	9
52	-8	-9	-51	-12	-8	-45	-4	1	6
51	-7	-12	-50	-12	-12	-48	-5	0	2
50	-6	-9	-47	-14	-14	-48	-8	-5	-1
49	-12	-3	-46	-15	-8	-44	-3	-5	2
48	-11	2	-47	-16	2	-38	-5	0	9
47	-10	4	-46	-16	9	-35	-6	5	11
46	-12	4	-42	-16	9	-36	-4	5	6
45	-15	2	-35	-17	4	-39	-2	2	-4
44	-16	-3	-31	-16	-3	-37	0	0	-6
43	-15	-6	-30	-16	-10	-33	-1	-4	-3
42	-16	-6	-31	-17	-8	-33	-1	-2	-2
41	-19	-4	-30	-20	-2	-27	-1	2	3
40	-23	-2	-27	-23	0	-23	0	2	4
39	-25	-1	-23	-24	-7	-35	1	-6	-12
38	-27	1	-21	-26	-17	-23	1	-18	-2
37	-30	3	-19	-29	4	-12	1	1	7
36	-30	4	-19	-30	11	-20	0	7	-1
35	-31	3	-20	-30	3	-24	1	0	-4
34	-34	0	-21	-32	-1	-23	2	-1	-2
33	-34	-1	-23	-32	-2	-24	2	-1	-1
32	-36	-2	-23	-34	2	-27	2	4	-4
31	-39	-1	-22	-36	-1	-27	3	0	-5
30	-45	-1	-20	-42	-2	-17	3	-1	3
29	-45	-1	-17	-44	-1	-19	1	0	-2
28	-44	-1	-15	999	999	999			
27	-45	-1	-12	999	999	999			
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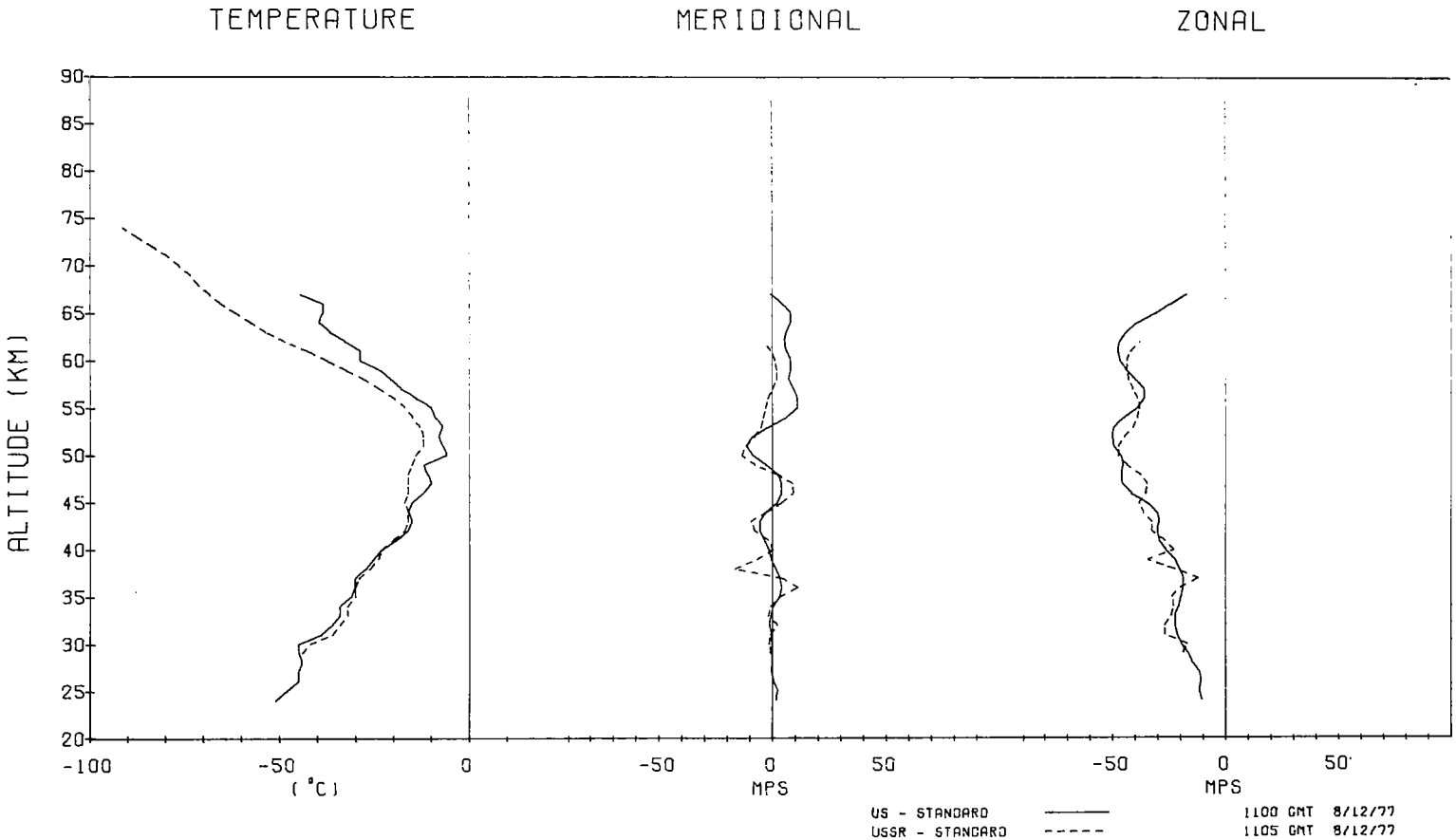
24	-51	1	-11	999	999	999			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-50
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(°C)
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MPS
US - STANDARD
USSR - STANDARD
1100 GMT 8/12/77
1105 GMT 8/12/77

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ALT	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
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71	999	999	999	-46	999	999			
70	999	999	999	-45	999	999			
69	999	999	999	-44	999	999			
68	-48	-16	-61	-43	999	999	5		
67	-47	-12	-58	-42	999	999	5		
66	-45	-10	-53	-41	999	999	4		
65	-42	-6	-49	-39	999	999	3		
64	-39	3	-47	-36	999	999	3		
63	-36	13	-50	-34	999	999	2		
62	-34	19	-52	-30	999	999	4		
61	-31	16	-50	-27	999	999	4		
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59	-24	1	-33	-20	2	-25	4	1	8
58	-19	1	-27	-18	3	-26	1	2	1
57	-14	7	-28	-15	3	-26	-1	-4	2
56	-10	14	-33	-14	3	-28	-4	-11	5
55	-9	17	-38	-12	4	-30	-3	-13	8
54	-8	14	-42	-11	5	-34	-3	-9	8
53	-5	9	-42	-11	8	-38	-6	-1	4
52	-3	8	-39	-9	13	-45	-6	5	-6
51	-4	10	-36	-7	20	-45	-3	10	-9
50	-4	12	-34	-4	23	-41	0	11	-7
49	-2	12	-35	-4	16	-33	-2	4	2
48	-1	9	-36	-4	9	-30	-3	0	6
47	0	6	-35	-4	6	-31	-4	0	4
46	1	3	-33	-5	3	-31	-6	0	2
45	1	1	-31	-5	1	-31	-6	0	0
44	0	0	-30	-5	5	-34	-5	5	-4
43	-6	2	-28	-8	8	-38	-2	6	-10
42	-15	4	-25	-14	0	-29	1	-4	-4
41	-16	7	-22	-18	3	-15	-2	-4	7
40	-17	8	-21	-19	11	-17	-2	3	4
39	-19	7	-21	-20	0	-32	-1	-7	-11
38	-21	5	-21	-25	0	-25	-4	-5	-4
37	-23	2	-20	-25	0	-22	-2	-2	-2
36	-24	1	-17	-24	2	-19	0	1	-2
35	-24	0	-16	-27	0	-17	-3	0	-1
34	-27	2	-15	-30	1	-17	-3	-1	-2
33	-30	4	-16	-32	8	-17	-2	4	-1
32	-31	4	-17	-35	3	-19	-4	-1	-2
31	-35	3	-17	-36	1	-15	-1	-2	2
30	-38	1	-16	-38	1	-18	0	0	-2
29	-38	1	-16	-40	-1	-16	-2	-2	0
28	-40	0	-15	999	999	999			
27	-41	0	-14	999	999	999			
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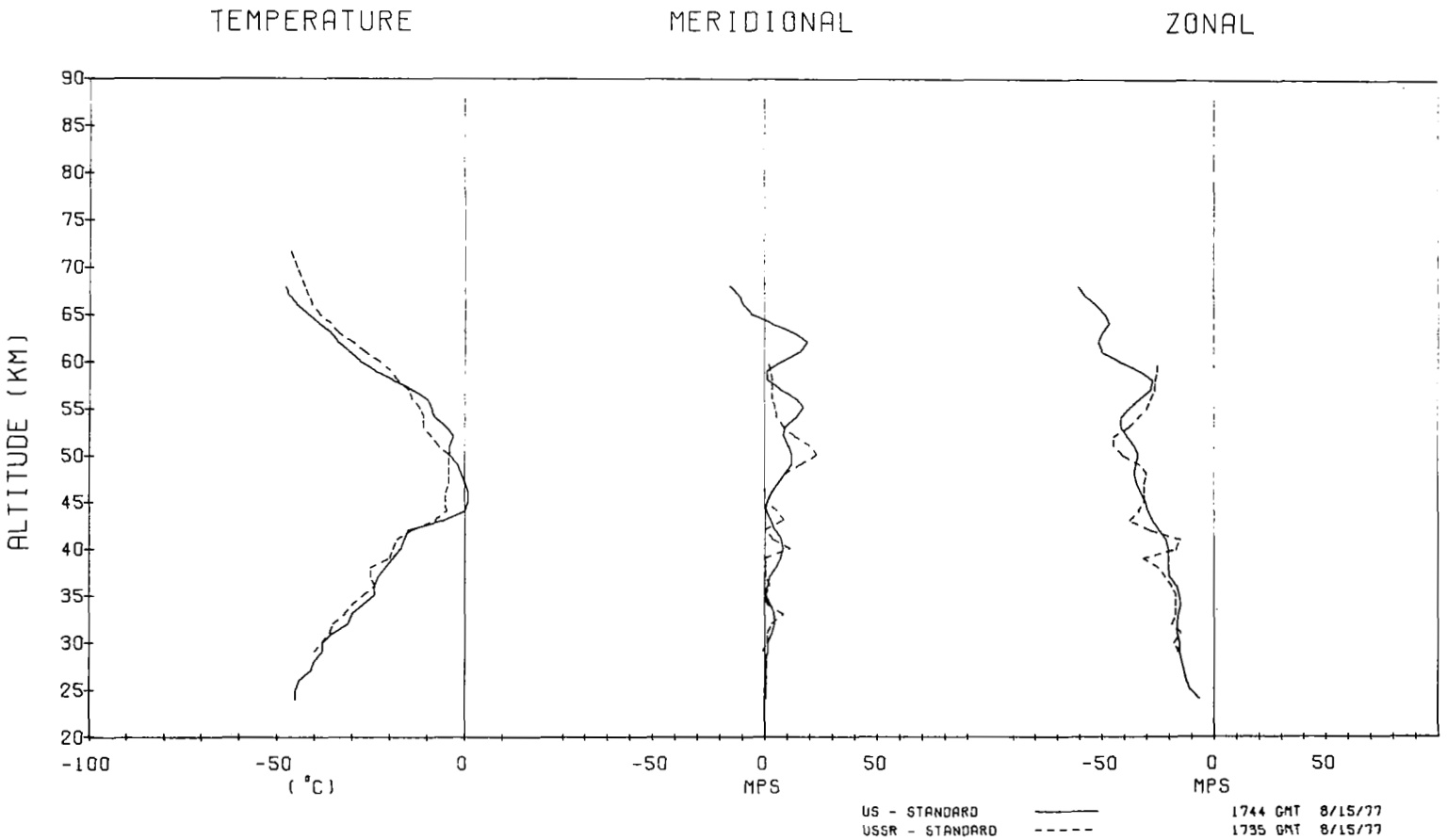
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-100
-50
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(°C)
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50
MPS
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MPS
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USSR - STANDARD
1744 GMT 8/15/77
1735 GMT 8/15/77

ALT	US - STANDARD AUG 15 1977 1930 GMT			USSR - STANDARD AUG 15 1977 1935 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
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73	999	28	-13	-78	999	999			
72	999	28	-27	-75	999	999			
71	999	20	-40	-72	999	999			
70	-61	7	-49	-69	999	999	-8		
69	-58	-2	-50	-66	999	999	-8		
68	-51	-1	-47	-64	999	999	-13		
67	-45	3	-44	-61	999	999	-16		
66	-39	4	-43	-58	999	999	-19		
65	-39	0	-40	-55	999	999	-16		
64	-39	0	-36	-51	11	-34	-12	11	2
63	-34	5	-35	-47	10	-34	-13	5	1
62	-31	11	-38	-43	8	-34	-12	-3	4
61	-31	12	-42	-38	5	-34	-7	-7	8
60	-26	5	-43	-34	1	-34	-8	-4	9
59	-23	-4	-40	-30	-3	-33	-7	1	7
58	-21	-9	-36	-26	-6	-33	-5	3	3
57	-17	-5	-32	-23	-6	-34	-6	-1	-2
56	-14	5	-33	-19	-4	-37	-5	-9	-4
55	-13	12	-34	-16	2	-42	-3	-10	-8
54	-11	15	-37	-13	7	-48	-2	-8	-11
53	-8	14	-38	-11	11	-50	-3	-3	-12
52	-5	13	-38	-9	10	-43	-4	-3	-5
51	-3	13	-37	-9	8	-30	-6	-5	7
50	-4	13	-35	-8	8	-25	-4	-5	10
49	-2	13	-36	-7	11	-36	-5	-2	0
48	-5	13	-38	-6	12	-51	-1	-1	-13
47	-4	10	-39	-5	10	-51	-1	0	-12
46	-4	5	-38	-5	8	-37	-1	3	1
45	-4	0	-36	-5	4	-30	-1	4	6
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43	-12	-1	-26	-15	2	-25	-3	3	1
42	-21	3	-22	-23	12	-22	-2	9	0
41	-22	7	-18	-24	12	-19	-2	5	-1
40	-22	9	-17	-24	11	-16	-2	2	1
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38	-25	5	-19	-26	6	-24	-1	1	-5
37	-26	3	-19	-28	5	-25	-2	2	-6
36	-28	0	-18	-29	3	-18	-1	3	0
35	-31	-1	-16	-33	-5	-20	-2	-4	-4
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33	-36	4	-13	-36	2	-4	0	-2	9
32	-38	5	-14	-37	5	-15	1	0	-1
31	-39	4	-15	-39	-1	-15	0	-5	0
30	-42	2	-16	-42	-1	-15	0	-3	1
29	-44	1	-17	-43	-5	-21	1	-6	-4
28	-44	1	-16	999	999	999			
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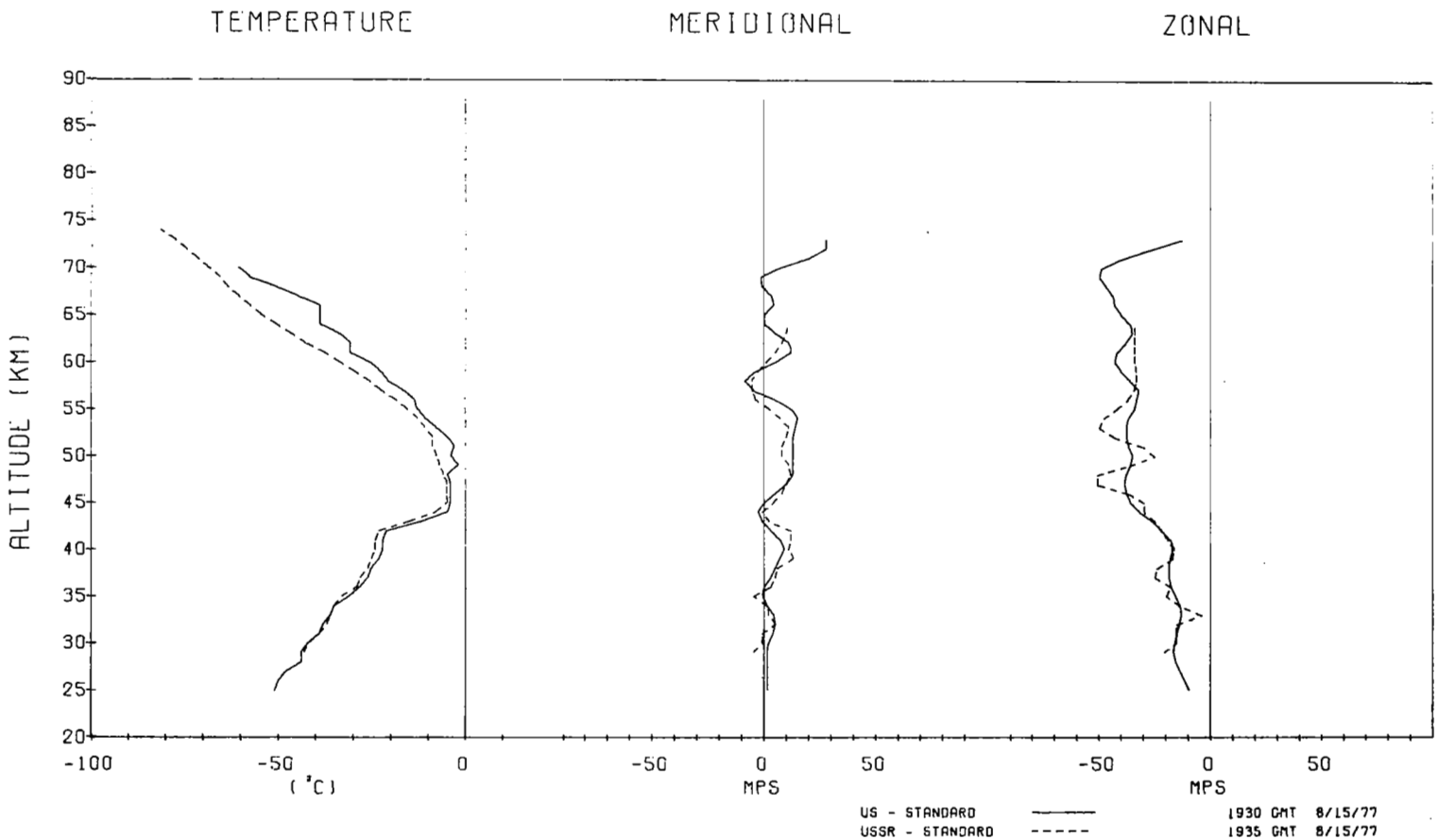
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(°C)
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-50
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MPS
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USSR - STANDARD
1930 GMT 8/15/77
1935 GMT 8/15/77

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71	999	-1	-2	999	999	999			
70	-47	11	-13	999	999	999			
69	-41	12	-25	999	999	999			
68	-39	3	-35	999	999	999			
67	-48	-7	-41	999	999	999			
66	-52	-11	-41	999	-37	11		-26	52
65	-52	-10	-33	-62	-36	10	-10	-26	43
64	-48	-8	-24	-53	-34	6	-5	-26	30
63	-44	-7	-18	-44	-29	1	0	-22	19
62	-38	-5	-18	-35	-23	-6	3	-18	12
61	-34	-2	-24	-27	-15	-15	7	-13	9
60	-30	-1	-33	-20	-6	-25	10	-5	8
59	-25	-2	-39	-14	3	-36	11	5	3
58	-22	-2	-40	-11	12	-46	11	14	-6
57	-18	1	-38	-9	18	-53	9	17	-15
56	-14	5	-36	-9	21	-55	5	16	-19
55	-9	9	-36	-10	18	-53	-1	9	-17
54	-6	9	-36	-9	12	-48	-3	3	-12
53	-3	4	-36	-8	6	-44	-5	2	-8
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43	-12	0	-29	-10	4	-31	2	4	-2
42	-17	-2	-31	-15	-4	-31	2	-2	0
41	-18	-4	-28	-17	-4	-27	1	0	1
40	-20	-3	-23	-18	-8	-26	2	-5	-3
39	-23	-2	-19	-19	-5	-20	4	-3	-1
38	-24	0	-17	-20	-2	-21	4	-2	-4
37	-25	1	-18	-23	-4	-18	2	-5	0
36	-29	1	-22	-28	4	-25	1	3	-3
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34	-36	-4	-23	-34	-1	-25	2	3	-2
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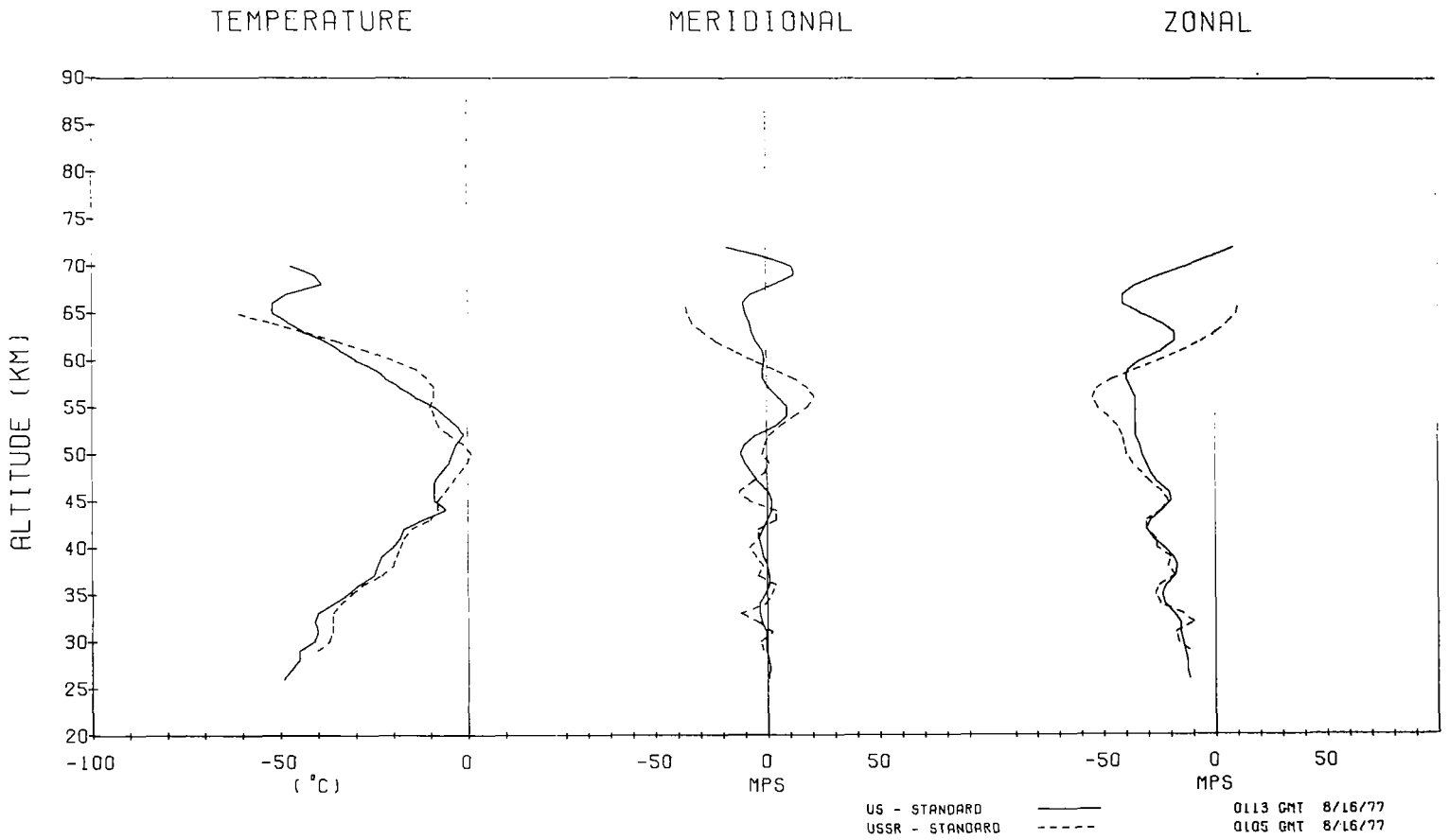
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(°C)
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0113 GMT 8/16/77
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66	-43	-26	-30	-53	-8	-20	-10	18	10
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63	-42	-9	-16	-41	-1	-27	1	8	-11
62	-37	-2	-18	-36	0	-29	1	2	-11
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60	-30	10	-34	-29	3	-35	1	-7	-1
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58	-22	9	-53	-21	4	-41	1	-5	12
57	-20	7	-55	-18	4	-45	2	-3	10
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48	-4	10	-28	0	8	-27	4	-2	1
47	-3	9	-28	1	8	-28	4	-1	0
46	-4	8	-30	0	8	-31	4	0	-1
45	-8	5	-33	-4	5	-34	4	0	-1
44	-10	1	-33	-7	1	-33	3	0	0
43	-13	-1	-30	-9	-2	-30	4	-1	0
42	-18	0	-26	-11	0	-26	7	0	0
41	-18	3	-23	-14	7	-21	4	4	2
40	-19	5	-20	-17	10	-19	2	5	1
39	-21	6	-19	-20	8	-20	1	2	-1
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37	-26	1	-20	-24	-2	-23	2	-3	-3
36	-31	-1	-17	-27	-3	-17	4	-2	0
35	-32	0	-14	-28	3	-13	4	3	1
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28	-45	-1	-17	999	999	999			
27	-47	-1	-14	999	999	999			
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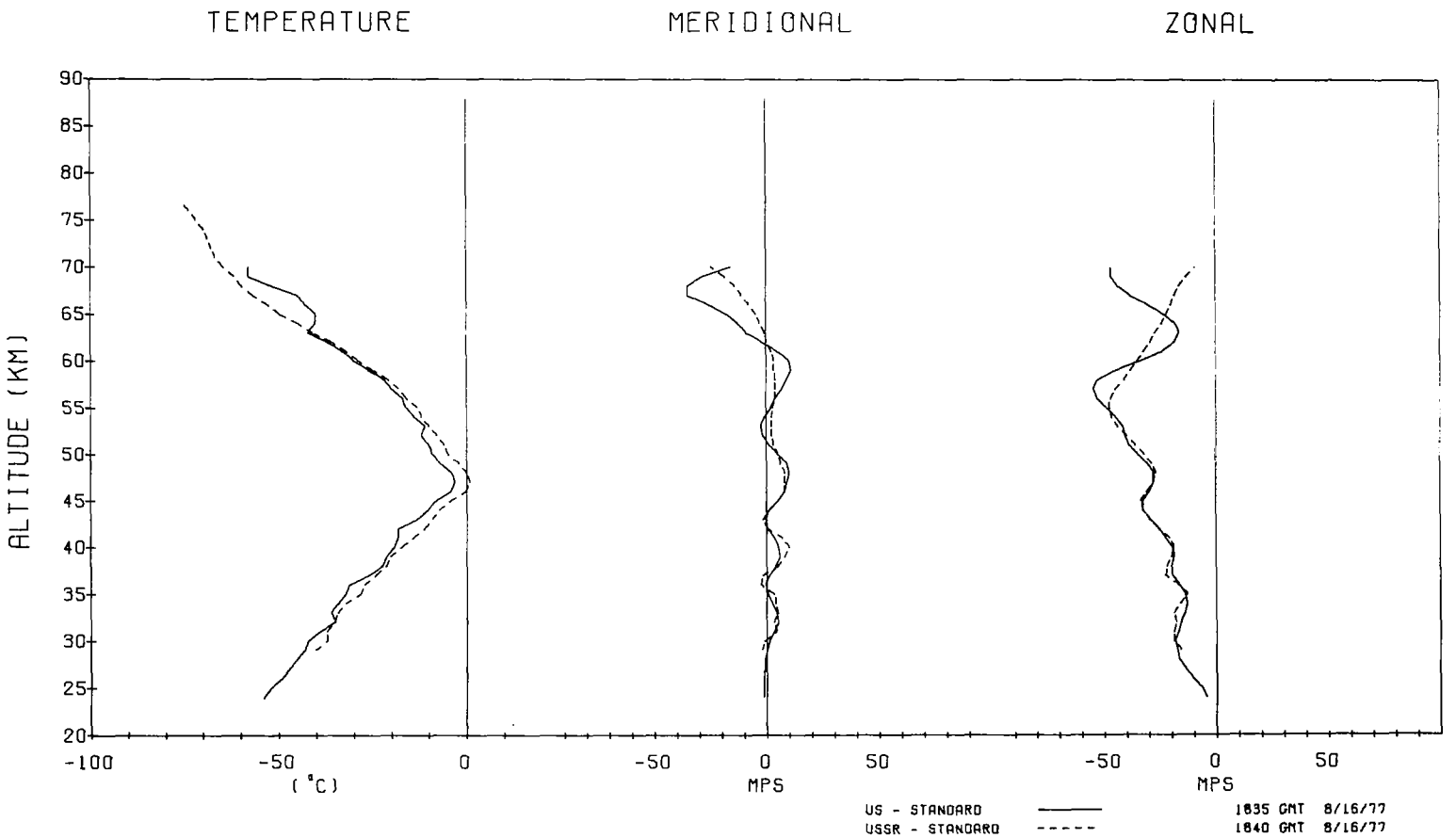
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1835 GMT 8/16/77
1840 GMT 8/16/77

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69	-55	-2	-47	999	999	999			
68	-49	-7	-47	999	999	999			
67	-45	-11	-42	999	999	999			
66	-42	-13	-36	999	999	999			
65	-37	-17	-31	999	999	999			
64	-36	-23	-26	999	6	-16		29	10
63	-33	-24	-22	999	6	-19		30	3
62	-32	-14	-20	999	6	-20		20	0
61	-31	1	-21	999	5	-22		4	-1
60	-28	15	-26	999	4	-24		-11	2
59	-23	20	-33	999	2	-26		-18	7
58	-21	18	-41	999	1	-28		-17	13
57	-16	13	-44	999	0	-30		-13	14
56	-14	9	-45	999	-1	-33		-10	12
55	-11	6	-43	999	-2	-36		-8	7
54	-9	4	-42	-9	-3	-37	0	-7	5
53	-6	1	-40	-4	-4	-35	2	-5	5
52	-5	-3	-38	-5	-4	-34	0	-1	4
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46	-4	6	-29	-14	7	-33	-10	1	-4
45	-7	6	-32	-10	7	-32	-3	1	0
44	-8	5	-34	-9	6	-33	-1	1	1
43	-9	3	-33	-10	4	-32	-1	1	1
42	-14	3	-28	-12	2	-28	2	-1	0
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35	-30	-3	-16	-31	-10	-17	-1	-7	-1
34	-32	-2	-14	-32	-7	-13	0	-5	1
33	-34	1	-14	-33	-2	-12	1	-3	2
32	-36	3	-16	-34	2	-15	2	-1	1
31	-38	4	-17	-33	6	-18	5	2	-1
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28	-44	1	-16	-40	0	-16	4	-1	0
27	-45	1	-15	-41	0	-15	4	-1	0
26	-47	0	-13	-43	0	-14	4	0	-1
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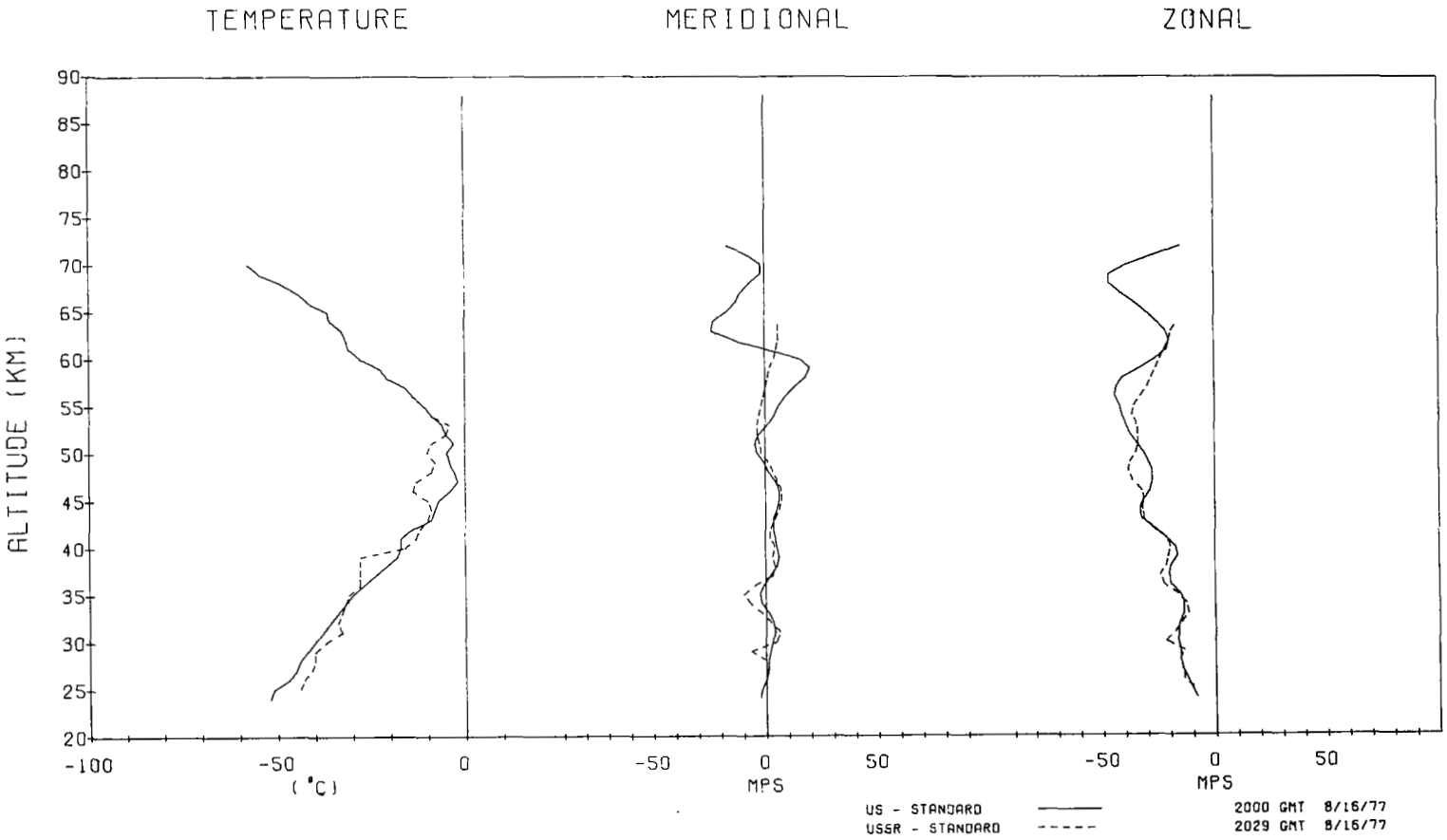
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(°C)
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2029 GMT 8/16/77

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KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
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79	999	999	999	-102	999	999			
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77	999	999	999	-91	999	999			
76	999	999	999	-86	999	999			
75	999	999	999	-82	999	999			
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71	999	12	-8	-67	999	999			
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69	-43	27	-10	-61	999	999	-18		
68	-39	26	-24	-57	999	999	-18		
67	-43	21	-39	-54	999	999	-11		
66	-40	15	-46	-51	999	999	-11		
65	-36	12	-44	-48	8	-21	-12	-4	23
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60	-21	6	-28	-30	17	-24	-9	11	4
59	-18	15	-21	-27	20	-26	-9	5	-5
58	-18	20	-19	-23	23	-29	-5	3	-10
57	-10	22	-22	-20	26	-32	-10	4	-10
56	-8	27	-28	-16	28	-36	-8	1	-8
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42	-10	3	-24	-12	4	-20	-2	1	4
41	-13	1	-23	-13	-1	-22	0	-2	1
40	-18	0	-20	-17	-1	-23	1	-1	-3
39	-23	0	-17	-24	-3	-21	-1	-3	-4
38	-24	-2	-17	-28	-1	-23	-4	1	-6
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35	-28	-2	-15	-31	3	-16	-3	5	-1
34	-29	0	-14	-32	4	-13	-3	4	1
33	-32	1	-13	-33	2	-11	-1	1	2
32	-33	0	-15	-34	3	-18	-1	3	-3
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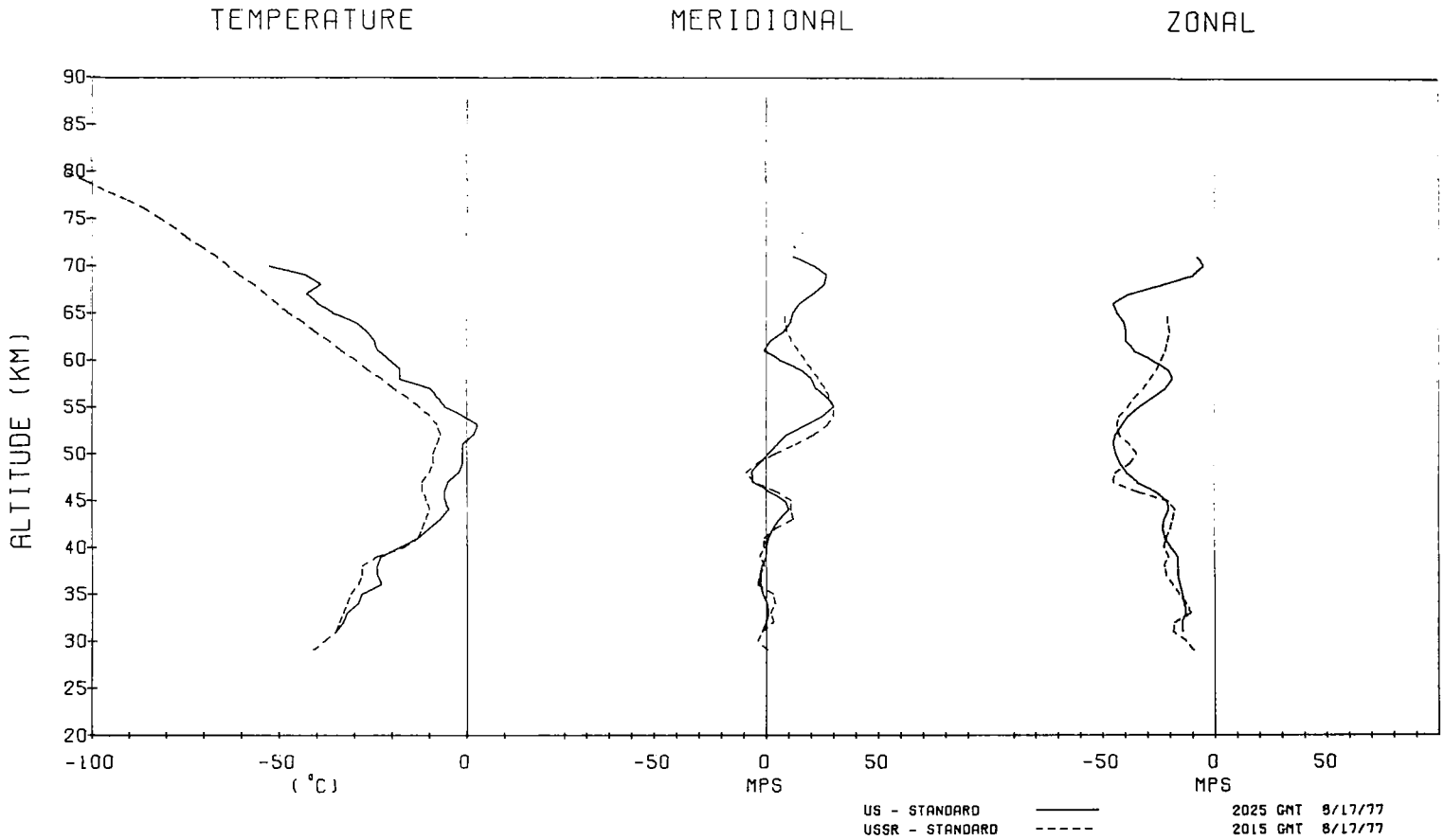
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2015 GMT 8/17/77

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77	999	999	999	-81	999	999			
76	999	999	999	-80	999	999			
75	999	999	999	-80	999	999			
74	999	999	999	-80	999	999			
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65	-45	-1	-39	-61	-11	-20	-16	-10	19
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63	-37	-9	-41	-51	-12	-23	-14	-3	18
62	-34	-14	-38	-46	-13	-24	-12	1	14
61	-30	-17	-33	-42	-14	-25	-12	3	8
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59	-22	-16	-26	-35	-13	-28	-13	3	-2
58	-19	-13	-25	-31	-11	-30	-12	2	-5
57	-20	-8	-25	-28	-8	-34	-8	0	-9
56	-21	-5	-27	-24	-4	-38	-3	1	-11
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54	-15	-4	-28	-18	-1	-37	-3	3	-9
53	-13	-2	-27	-16	-6	-27	-3	-4	0
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29	-44	1	-13	-42	3	-26	2	2	-13
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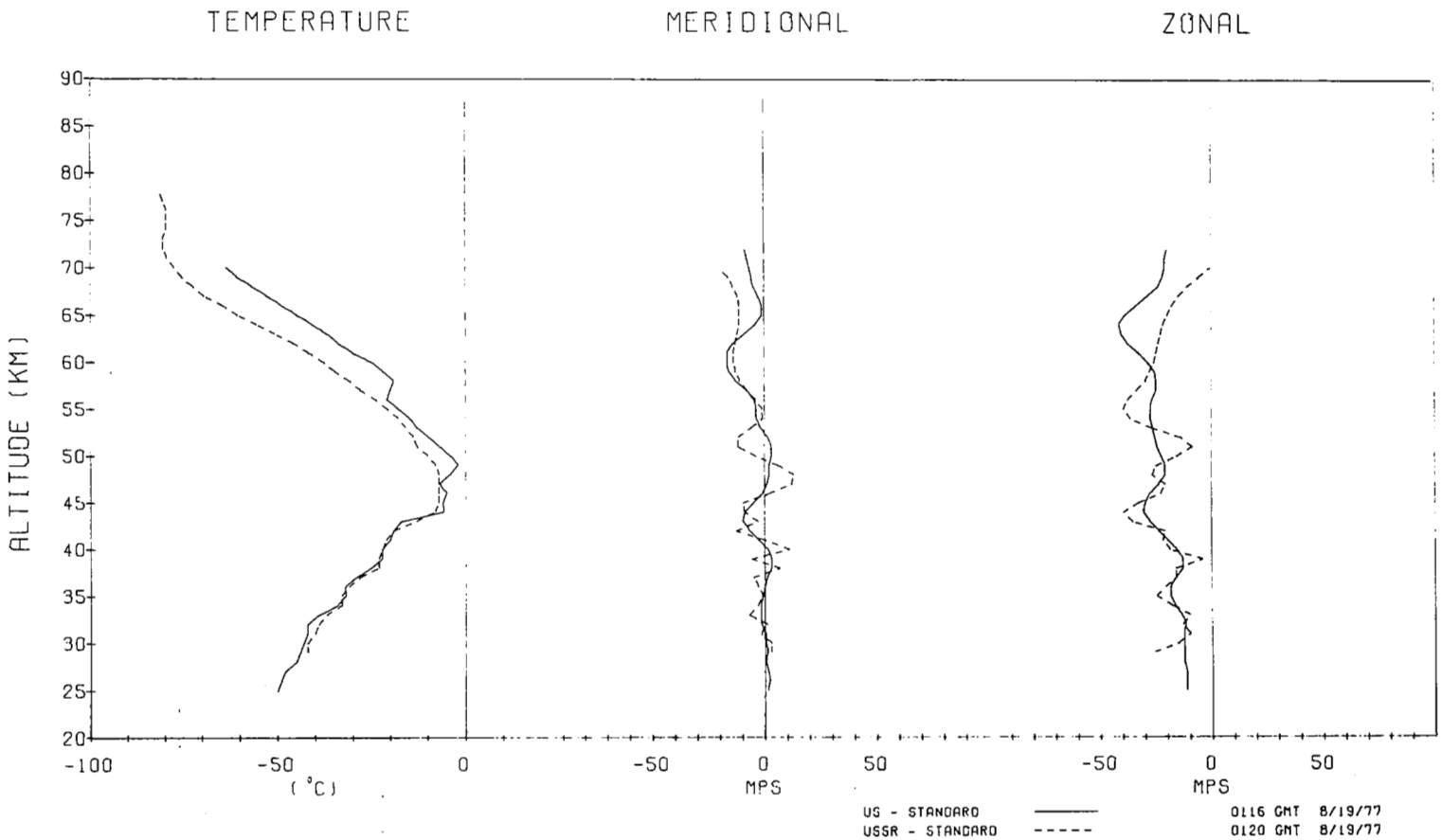
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67	999	-16	-12	999	-4	-24		12	-12
66	999	-7	-13	999	-11	-23		-4	-10
65	999	-5	-27	999	-16	-23		-11	4
64	999	-9	-44	999	-21	-24		-12	20
63	999	-17	-52	999	-25	-27		-8	25
62	999	-24	-49	999	-27	-29		-3	20
61	999	-25	-41	999	-28	-33		-3	8
60	999	-25	-34	999	-26	-37		-1	-3
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53	999	-1	-26	999	-6	-25		-5	1
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51	999	-4	-27	999	-5	-29		-1	-2
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48	999	999	999	999	-5	-30			
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45	999	999	999	999	-10	-24			
44	999	999	999	999	-11	-28			
43	999	999	999	999	-10	-29			
42	999	999	999	999	-8	-28			
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40	999	999	999	999	-3	-19			
39	999	999	999	999	-1	-17			
38	999	999	999	999	0	-15			
37	999	999	999	999	0	-15			
36	999	999	999	999	-1	-17			
35	999	999	999	999	-1	-19			
34	999	999	999	999	1	-18			
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32	999	999	999	999	0	-14			
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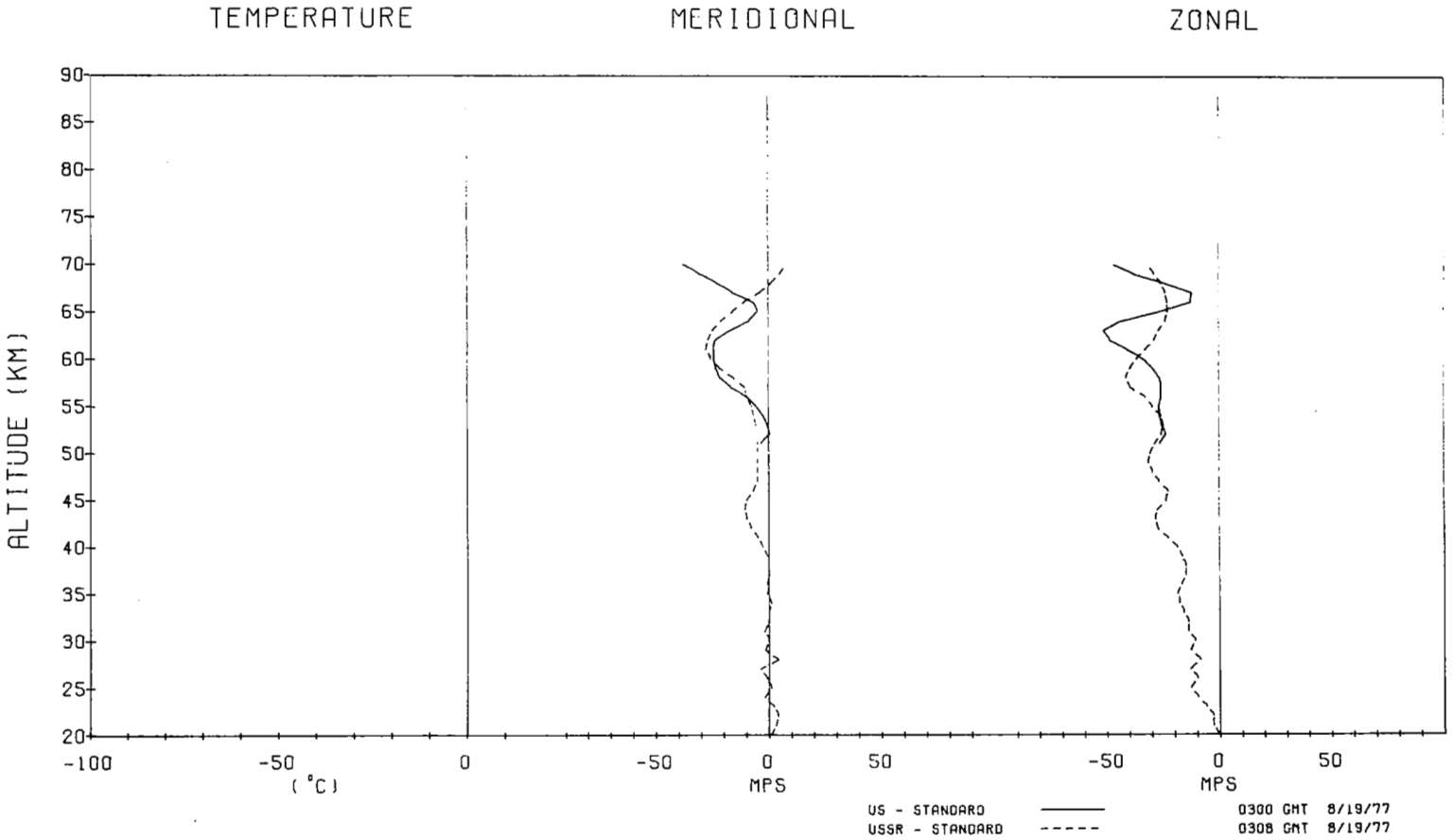
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-100
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(°C)
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-50
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MPS
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USSR - STANDARD
0300 GMT 8/19/77
0308 GMT 8/19/77

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ALT	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
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75	999	999	999	-81	999	999			
74	999	999	999	-78	999	999			
73	999	999	999	-77	999	999			
72	999	999	999	-75	999	999			
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70	999	999	999	-73	999	999			
69	-61	-34	-56	-72	999	999	-11		
68	-59	-39	-47	-70	999	999	-11		
67	-53	-38	-36	-68	999	999	-15		
66	-49	-28	-29	-65	999	999	-16		
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63	-43	-7	-61	-54	-26	-44	-11	-19	17
62	-40	-11	-67	-49	-28	-48	-9	-17	19
61	-36	-13	-64	-44	-30	-51	-8	-17	13
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58	-25	-19	-40	-31	-30	-48	-6	-11	-8
57	-22	-23	-36	-28	-27	-43	-6	-4	-7
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48	-6	-6	-32	-8	-8	-33	-2	-2	-1
47	-8	-7	-30	-8	-12	-27	0	-5	3
46	-9	-5	-29	-10	-24	-18	-1	-19	11
45	-10	-4	-30	-13	-30	-20	-3	-26	10
44	-10	-5	-30	-15	-15	-31	-5	-10	-1
43	-14	-4	-29	-16	3	-36	-2	7	-7
42	-18	-2	-25	-18	0	-30	0	2	-5
41	-19	0	-22	-21	-3	-26	-2	-3	-4
40	-21	-1	-20	-25	-4	-17	-4	-3	3
39	-25	-3	-19	-27	-5	-22	-2	-2	-3
38	-26	-3	-17	-27	-8	-15	-1	-5	2
37	-28	1	-17	-28	1	-15	0	0	2
36	-31	5	-18	-29	11	-17	2	6	1
35	-33	5	-20	-30	12	-23	3	7	-3
34	-35	2	-19	-33	-4	-20	2	-6	-1
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32	-36	-2	-14	-41	-8	-12	-5	-6	2
31	-39	-2	-13	-42	-7	-13	-3	-5	0
30	-42	-2	-14	-43	2	-13	-1	4	1
29	-46	0	-14	-45	1	-19	1	1	-5
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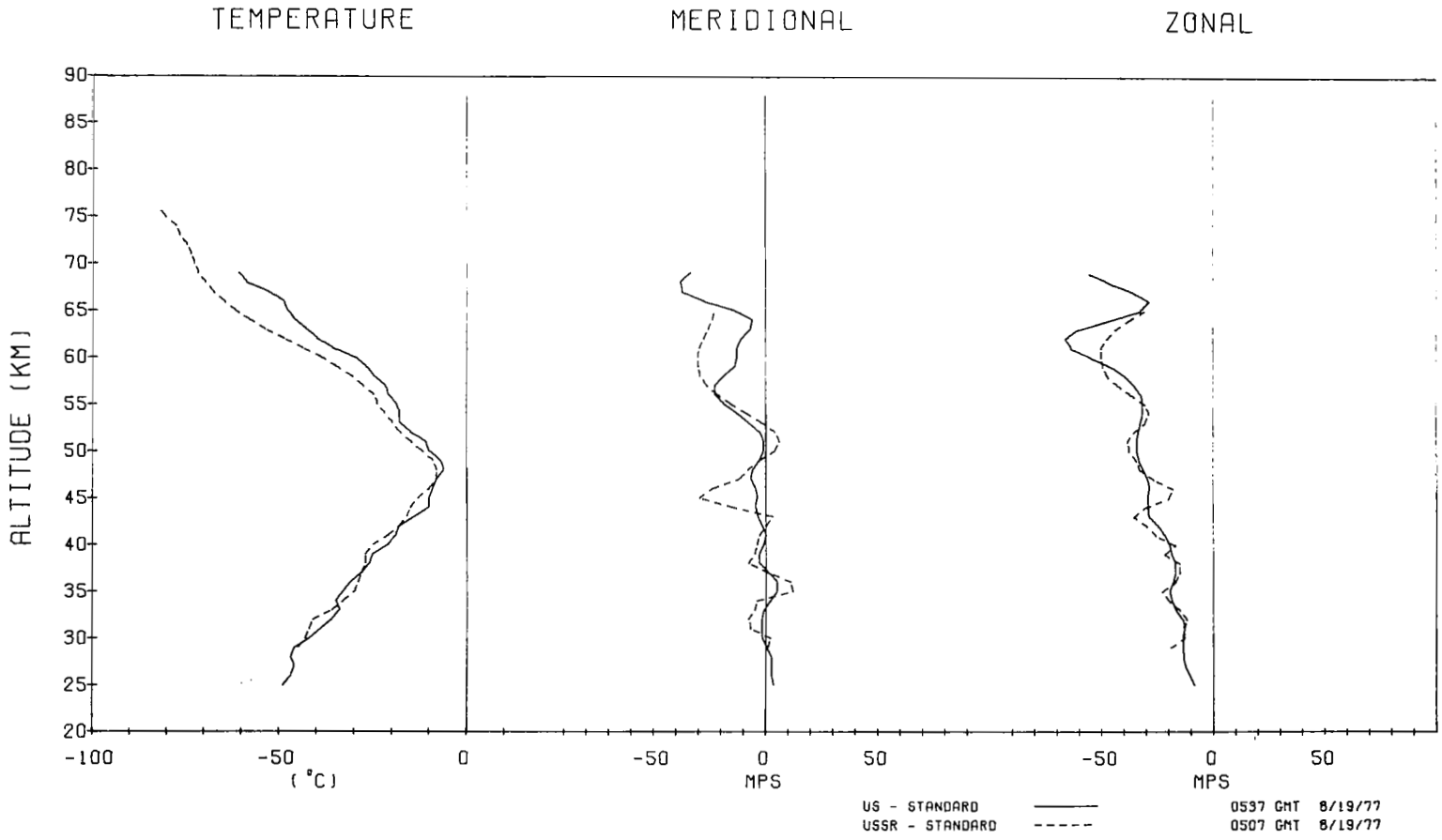
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(°C)
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MPS
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USSR - STANDARD
0537 GMT 8/19/77
0507 GMT 8/19/77

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ALT	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
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76	999	999	999	-64	999	999			
75	999	999	999	-61	999	999			
74	999	999	999	-58	999	999			
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72	999	999	999	-53	999	999			
71	999	28	-13	-51	999	999			
70	-54	29	-14	-49	999	999	5		
69	-50	28	-14	-47	999	999	3		
68	-46	26	-16	-45	999	999	1		
67	-40	24	-17	-44	999	999	-4		
66	-33	22	-19	-43	999	999	-10		
65	-32	19	-21	-41	999	999	-9		
64	-35	16	-23	-40	999	999	-5		
63	-36	13	-27	-38	999	999	-2		
62	-35	11	-30	-35	999	999	0		
61	-34	8	-34	-33	999	999	1		
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59	-29	6	-39	-28	5	-31	1	-1	8
58	-29	9	-41	-26	9	-30	3	0	11
57	-25	15	-43	-24	13	-28	1	-2	15
56	-20	18	-45	-22	17	-26	-2	-1	19
55	-16	17	-45	-21	20	-23	-5	3	22
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50	-11	4	-32	-10	-4	-50	1	-8	-18
49	-8	6	-36	-8	0	-43	0	-6	-7
48	-4	7	-38	-7	10	-34	-3	3	4
47	0	6	-35	-6	11	-35	-6	5	0
46	-2	3	-31	-5	5	-34	-3	2	-3
45	-4	0	-28	-4	1	-22	0	1	6
44	-10	-1	-25	-6	-1	-15	4	0	10
43	-14	0	-24	-10	-2	-21	4	-2	3
42	-18	3	-22	-15	-6	-25	3	-9	-3
41	-20	7	-21	-19	0	-21	1	-7	0
40	-22	9	-22	-20	16	-21	2	7	1
39	-23	6	-22	-23	8	-24	0	2	-2
38	-25	4	-20	-25	-3	-22	0	-7	-2
37	-32	2	-17	-27	5	-20	5	3	-3
36	-31	2	-15	-29	1	-15	2	-1	0
35	-31	1	-14	-28	5	-14	3	4	0
34	-35	0	-13	-29	-5	-14	6	-5	-1
33	-38	0	-11	-31	-2	-12	7	-2	-1
32	-39	0	-10	-35	5	-9	4	5	1
31	-39	2	-11	-36	0	-11	3	-2	0
30	-42	1	-12	-38	3	-13	4	2	-1
29	-46	1	-13	-39	-1	-16	7	-2	-3
28	-44	1	-13	999	999	999			
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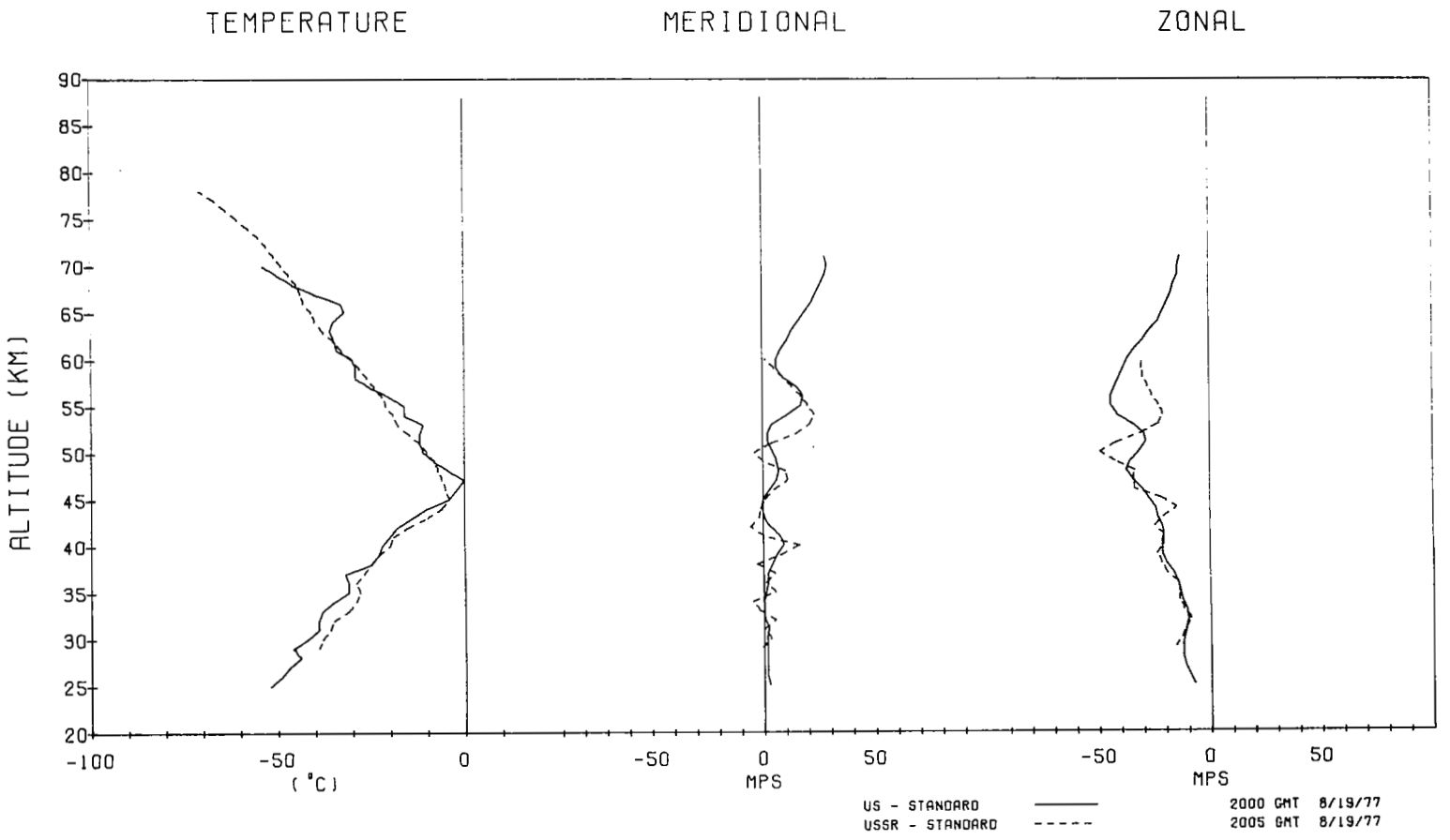
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USSR - STANDARD
2000 GMT 8/19/77
2005 GMT 8/19/77

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74	999	30	-28	-79	999	999			
73	999	19	-22	-78	999	999			
72	999	12	-15	-76	999	999			
71	999	12	-8	-74	999	999			
70	-53	17	-4	-71	24	-14	-18	7	-10
69	-48	20	-4	-69	24	-19	-21	4	-15
68	-42	17	-7	-66	23	-22	-24	6	-15
67	-39	12	-9	-63	19	-24	-24	7	-15
66	-37	10	-9	-60	16	-24	-23	6	-15
65	-34	12	-6	-56	12	-24	-22	0	-18
64	-33	13	-2	-53	9	-22	-20	-4	-20
63	-32	14	-1	-50	7	-21	-18	-7	-20
62	-29	14	-9	-46	6	-20	-17	-8	-11
61	-25	9	-21	-43	6	-19	-18	-3	2
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58	-22	3	-37	-32	-12	-19	-10	-15	18
57	-20	13	-38	-29	-14	-21	-9	-27	17
56	-17	20	-40	-26	-16	-24	-9	-36	16
55	-14	21	-41	-23	17	-28	-9	-4	13
54	-15	15	-39	-20	16	-33	-5	1	6
53	-10	7	-35	-17	12	-38	-7	5	-3
52	-8	0	-32	-14	6	-41	-6	6	-9
51	-5	-2	-32	-11	-1	-41	-6	1	-9
50	-6	-1	-33	-10	-3	-38	-4	-2	-5
49	-6	1	-35	-10	0	-34	-4	-1	1
48	-6	2	-35	-9	4	-35	-3	2	0
47	-8	2	-31	-9	3	-36	-1	1	-5
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44	-6	2	-25	-13	-11	-20	-7	-13	5
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42	-15	-2	-24	-16	7	-32	-1	9	-8
41	-18	1	-20	-20	-1	-27	-2	-2	-7
40	-19	5	-18	-23	2	-21	-4	-3	-3
39	-23	7	-18	-24	7	-22	-1	0	-4
38	-27	5	-20	-24	11	-16	3	6	4
37	-24	2	-20	-26	2	-18	-2	0	2
36	-32	0	-19	-30	-2	-21	2	-2	-2
35	-34	0	-18	-34	0	-18	0	0	0
34	-36	0	-16	-36	2	-16	0	2	0
33	-38	-1	-13	-37	-1	-14	1	0	-1
32	-39	-1	-11	-36	-5	-8	3	-4	3
31	-42	0	-10	-39	0	-9	3	0	1
30	-41	0	-10	-39	2	-9	2	2	1
29	-46	0	-11	-42	1	-17	4	1	-6
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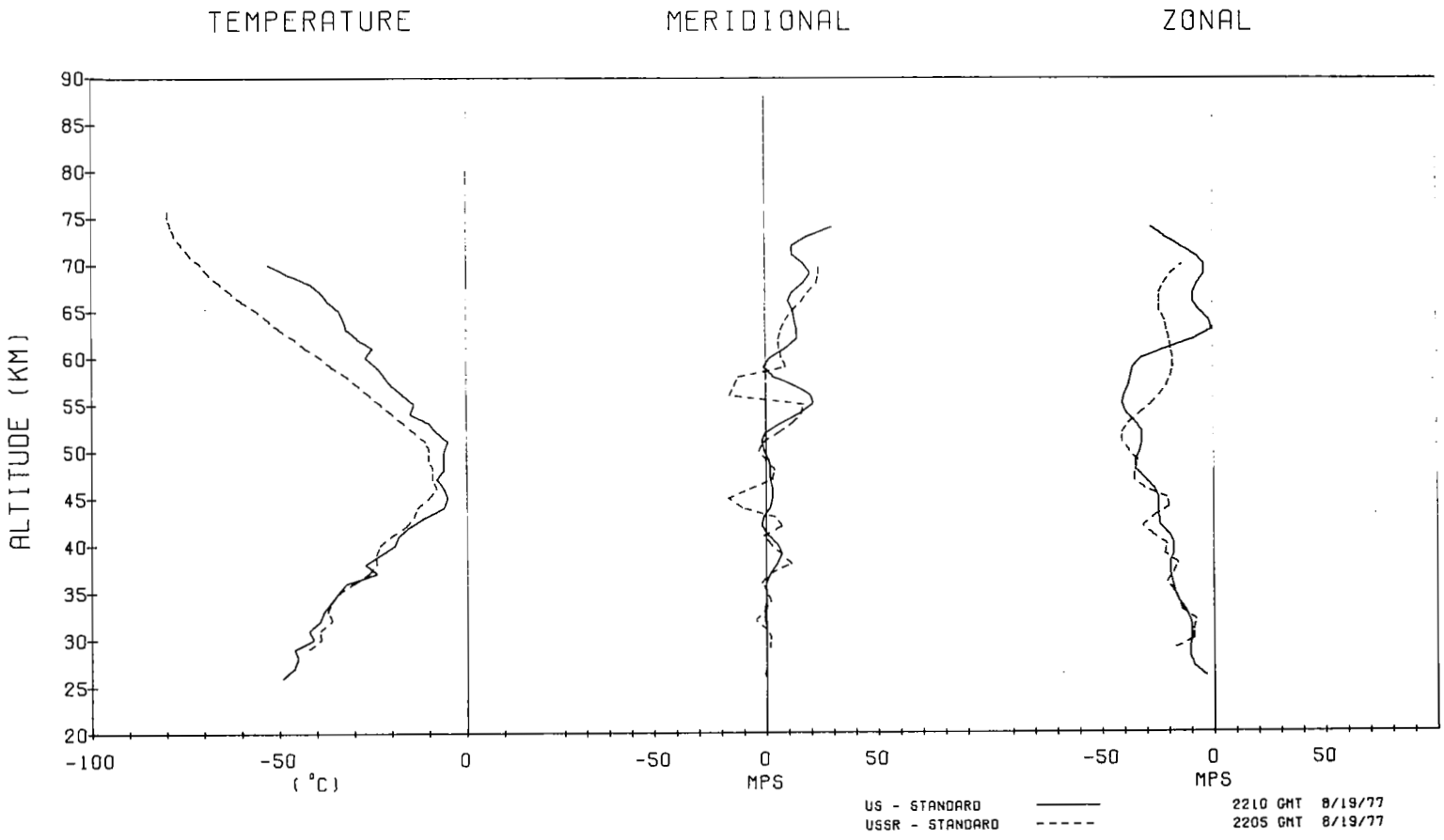
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2210 GMT 8/19/77
2205 GMT 8/19/77

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76	999	999	999	-80	999	999			
75	999	999	999	-80	999	999			
74	999	999	999	-79	999	999			
73	999	999	999	-78	999	999			
72	999	999	999	-77	999	999			
71	999	999	999	-74	999	999			
70	999	999	999	-72	999	999			
69	-51	30	8	-68	999	999	-17		
68	-45	26	7	-65	20	-24	-20	-6	-31
67	-42	21	6	-61	15	-24	-19	-6	-30
66	-40	16	2	-57	11	-22	-17	-5	-24
65	-37	9	-3	-53	7	-18	-16	-2	-15
64	-41	0	-11	-50	3	-14	-9	3	-3
63	-38	-7	-21	-46	0	-10	-8	7	11
62	-33	-11	-29	-43	-2	-6	-10	9	23
61	-33	-11	-34	-40	-2	-4	-7	9	30
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59	-29	-15	-36	-34	-2	-3	-5	13	33
58	-24	-13	-31	-31	0	-5	-7	13	26
57	-23	-3	-25	-29	2	-9	-6	5	16
56	-19	10	-22	-26	4	-16	-7	-6	6
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47	-10	4	-33	-11	3	-30	-1	-1	3
46	-9	1	-31	-12	0	-28	-3	-1	3
45	-7	-2	-27	-11	-9	-25	-4	-7	2
44	-8	-3	-24	-11	-15	-21	-3	-12	3
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42	-17	-4	-25	-16	-5	-27	1	-1	-2
41	-17	-3	-23	-20	0	-29	-3	3	-6
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37	-29	-1	-19	-28	0	-26	1	1	-7
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34	-37	1	-16	-37	2	-19	0	1	-3
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32	-40	-2	-14	-40	-7	-15	0	-5	-1
31	-42	-3	-14	-40	-2	-12	2	1	2
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29	-43	-1	-12	-43	-1	-17	0	0	-5
28	-47	0	-11	999	999	999			
27	-46	0	-10	999	999	999			
26	-48	1	-10	999	999	999			
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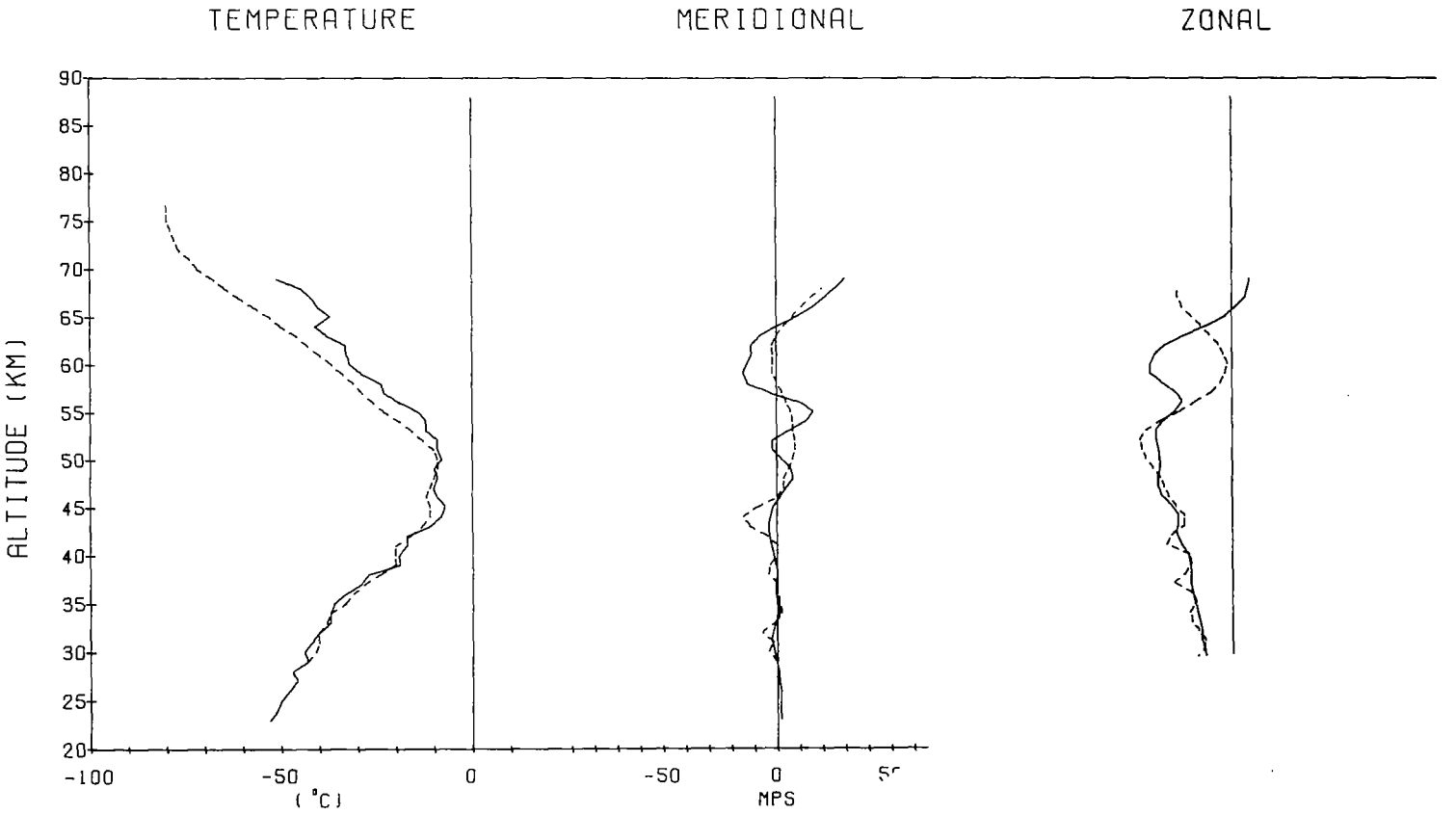
23	-53	1	-5	999	999	999			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74	999	999	999	-95	999	999			
73	999	999	999	-91	999	999			
72	999	999	999	-87	999	999			
71	999	999	999	-84	999	999			
70	999	999	999	-81	0	0			
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68	-47	5	-1	-74	-3	-13	-27	-8	-12
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51	-4	-6	-15	-9	-12	-11	-5	-6	4
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35	-29	-3	-20	-29	-5	-20	0	-2	0
34	-35	-3	-18	-32	-5	-17	3	-2	1
33	-39	-1	-17	-35	-2	-14	4	-1	3
32	-41	0	-16	-36	4	-20	5	4	-4
31	-39	1	-15	-36	-1	-15	3	-2	0
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27	-45	0	-10	999	999	999			
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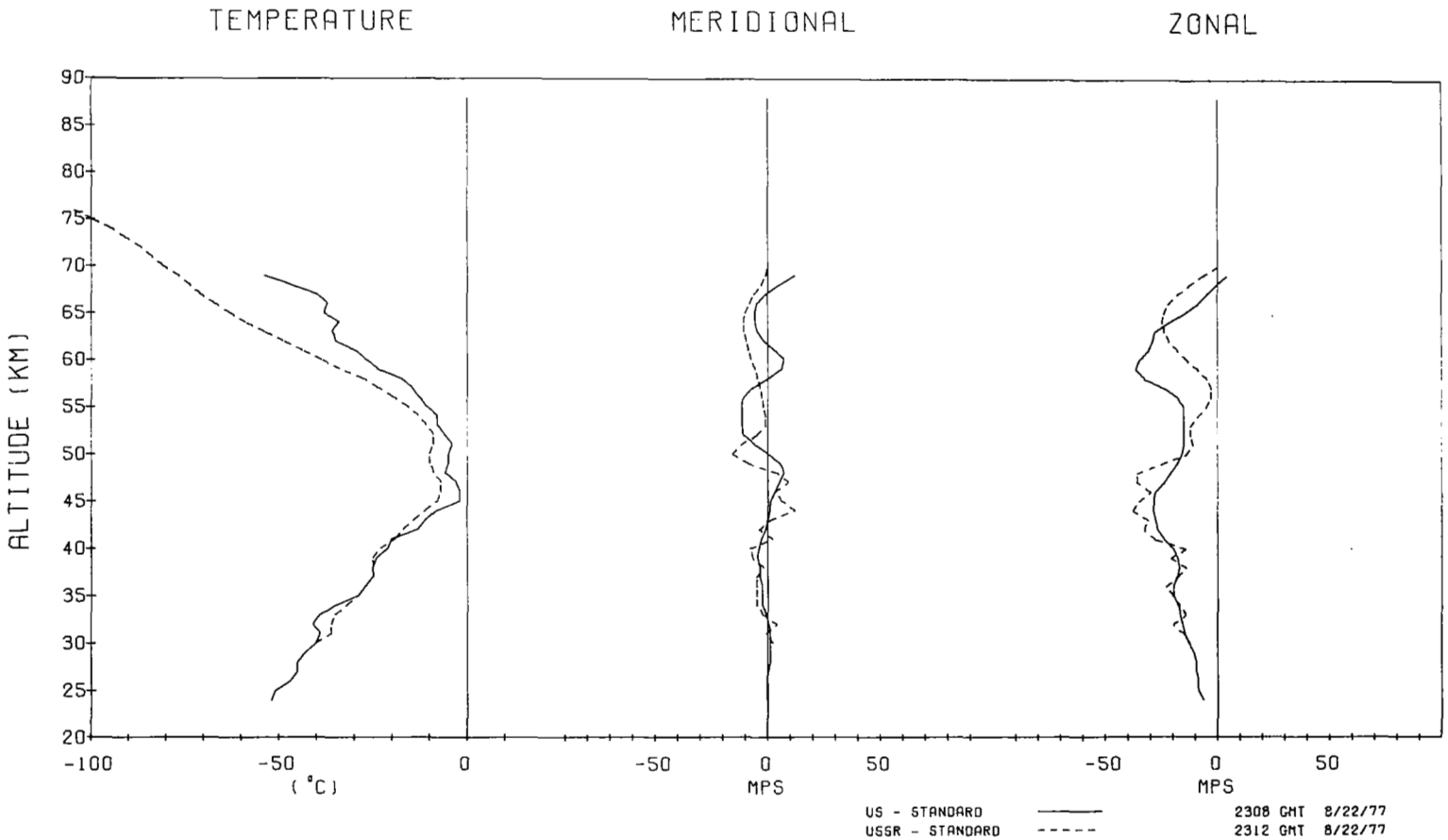
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-100
-50
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(°C)
-50
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MPS
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MPS
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2308 GMT 8/22/77
2312 GMT 8/22/77

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		NS	EW		NS	EW		NS	EW
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76	999	999	999	-81	999	999			
75	999	999	999	-82	999	999			
74	999	999	999	-84	999	999			
73	999	999	999	-85	999	999			
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69	999	999	999	-81	-19	17			
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66	-41	-1	12	-71	-18	-8	-30	-17	-20
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64	-40	-15	-16	-62	-17	-18	-22	-2	-2
63	-38	-18	-27	-56	-17	-21	-18	1	6
62	-36	-15	-29	-51	-17	-23	-15	-2	6
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59	-34	3	-34	-38	-19	-23	-4	-22	11
58	-29	1	-29	-34	-21	-21	-5	-22	8
57	-24	0	-23	-31	-22	-20	-7	-22	3
56	-21	-1	-18	-27	-23	-19	-6	-22	-1
55	-16	-3	-16	-23	-22	-18	-7	-19	-2
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45	-9	-1	-21	-14	-7	-7	-5	-6	14
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38	-28	-6	-20	-29	-3	-23	-1	3	-3
37	-32	-2	-19	-30	3	-28	2	5	-9
36	-32	0	-20	-31	4	-26	1	4	-6
35	-32	0	-21	-32	-3	-22	0	-3	-1
34	-33	-1	-20	-34	-4	-21	-1	-3	-1
33	-36	-1	-17	-35	0	-11	1	1	6
32	-38	0	-15	-38	-1	-13	0	-1	2
31	-42	0	-14	-39	0	-15	3	0	-1
30	-42	-1	-13	-39	-4	-12	3	-3	1
29	-43	-2	-12	-41	-11	-6	2	-9	6
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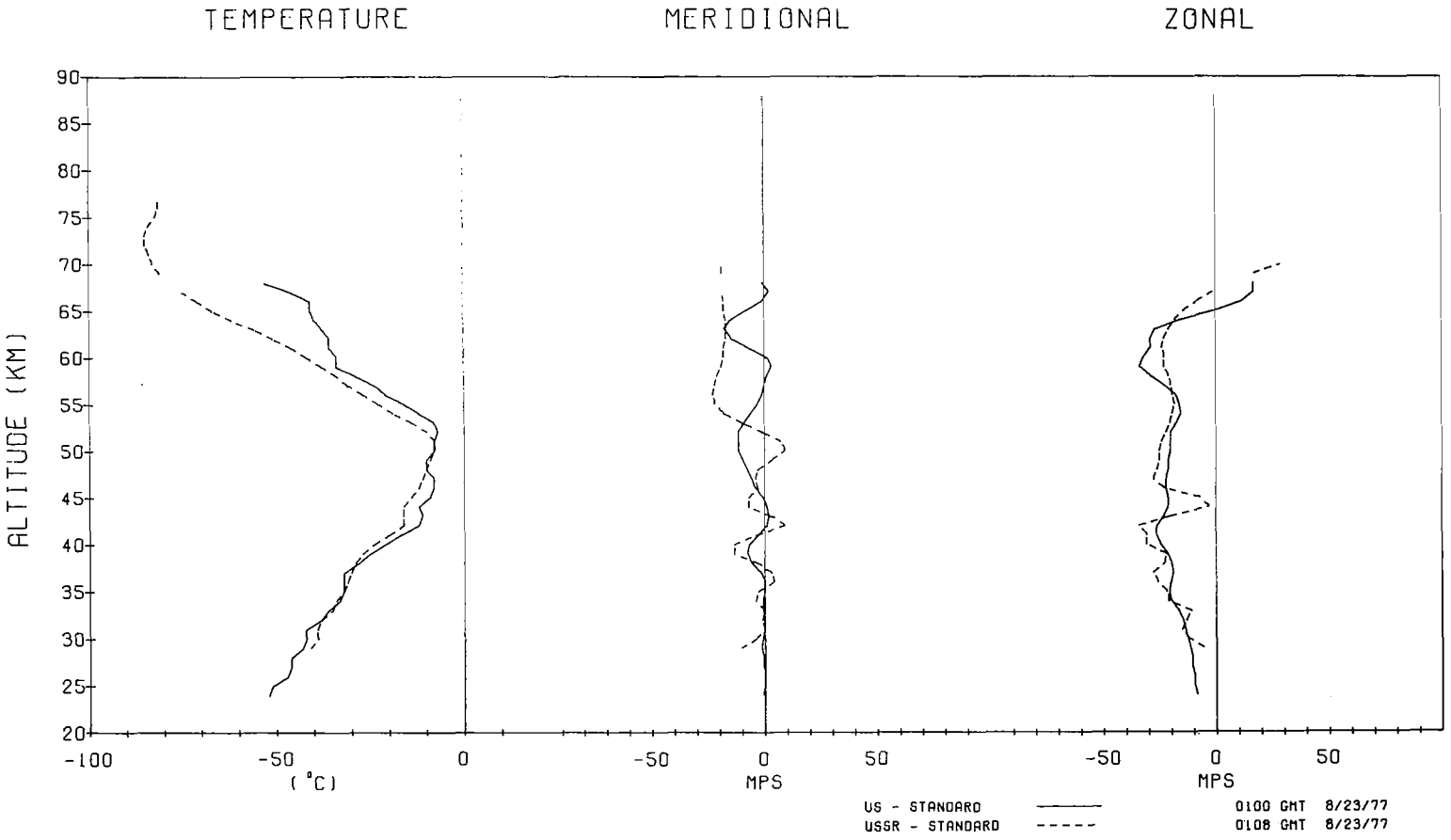
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-100
-50
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(°C)
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MPS
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USSR - STANDARD
0100 GMT 8/23/77
0108 GMT 8/23/77

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KM	DEG C	M S		DEG C	M S		DEG C	M S	
		NS	EW		NS	EW		NS	EW
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77	999	999	999	-86	999	999			
76	999	999	999	-84	999	999			
75	999	999	999	-82	999	999			
74	999	999	999	-81	999	999			
73	999	999	999	-80	999	999			
72	999	999	999	-79	999	999			
71	999	13	15	-77	999	999			
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67	-49	-18	8	-66	-17	-26	-17	1	-34
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49	-8	-8	-23	-9	-14	-18	-1	-6	5
48	-8	-4	-24	-9	-7	-20	-1	-3	4
47	-8	-2	-25	-9	-1	-24	-1	1	1
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38	-28	-4	-21	-27	-1	-29	1	3	-8
37	-30	1	-19	-29	2	-16	1	1	3
36	-31	5	-18	-30	3	-17	1	-2	1
35	-31	5	-20	-31	8	-25	0	3	-5
34	-33	2	-20	-33	-2	-16	0	-4	4
33	-36	0	-19	-33	-3	-19	3	-3	0
32	-38	0	-16	-35	-2	-19	3	-2	-3
31	-41	1	-14	-38	4	-15	3	3	-1
30	-40	1	-14	-39	1	-18	1	0	-4
29	-40	0	-14	-40	8	-15	0	8	-1
28	-44	0	-13	999	999	999			
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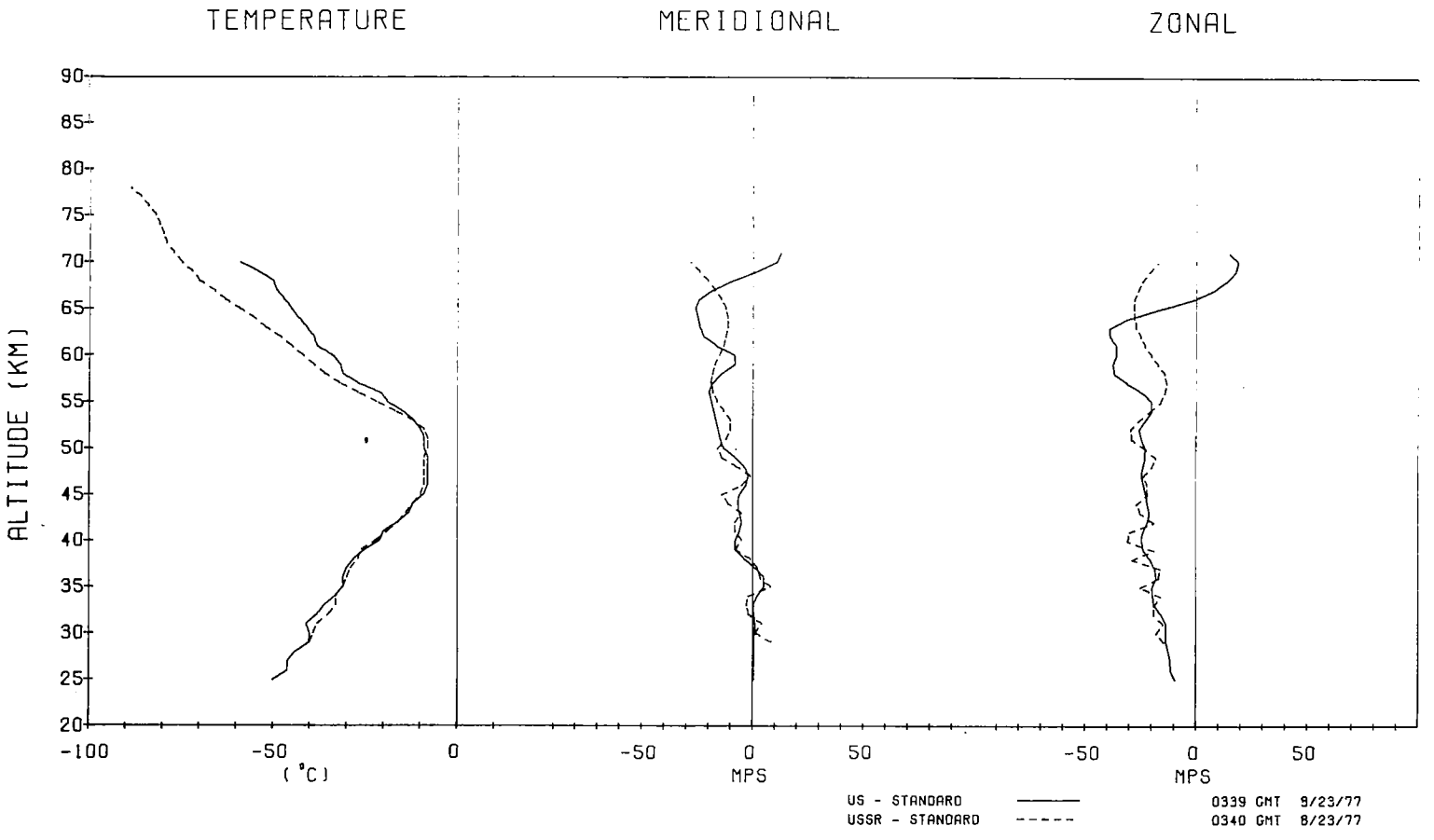
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77	999	999	999	-79	999	999			
76	999	999	999	-77	999	999			
75	999	999	999	-75	999	999			
74	999	999	999	-74	999	999			
73	999	999	999	-73	999	999			
72	999	999	999	-72	999	999			
71	999	999	999	-70	999	999			
70	999	999	999	-68	-5	-30			
69	999	999	999	-65	-5	-31			
68	999	999	999	-62	-6	-30			
67	999	-9	-21	-59	-6	-28		3	-7
66	999	-15	-30	-55	-6	-26		9	4
65	999	-19	-32	-52	-6	-22		13	10
64	-50	-21	-25	-48	-7	-19	2	14	6
63	-45	-17	-16	-44	-7	-15	1	10	1
62	-40	-10	-15	-41	-7	-11	-1	3	4
61	-33	-7	-22	-38	-6	-7	-5	1	15
60	-27	-6	-29	-34	-5	-5	-7	1	24
59	-25	-10	-27	-31	-4	-3	-6	6	24
58	-25	-14	-19	-28	-3	-4	-3	11	15
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51	-9	-5	-23	-12	-15	-15	-3	-10	8
50	-8	0	-21	-10	-4	-25	-2	-4	-4
49	-6	2	-19	-8	4	-31	-2	2	-12
48	-6	1	-16	-7	3	-27	-1	2	-11
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46	-7	-2	-15	-8	-3	-21	-1	-1	-6
45	-6	0	-17	-11	-1	-27	-5	-1	-10
44	-8	2	-21	-16	-1	-32	-8	-3	-11
43	-11	2	-25	-22	-3	-27	-11	-5	-2
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40	-27	-6	-22	-27	-4	-11	0	2	11
39	-30	-3	-19	-26	0	-16	4	3	3
38	-29	0	-18	-26	-3	-9	3	-3	9
37	-31	2	-19	-26	-1	-20	5	-3	-1
36	-30	3	-20	-28	5	-28	2	2	-8
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32	-39	-5	-16	-37	-5	-16	2	0	0
31	-42	-3	-15	-39	0	-15	3	3	0
30	-42	-2	-14	-40	-1	-11	2	1	3
29	-41	-1	-13	-40	7	-15	1	8	-2
28	-44	0	-12	999	999	999			
27	-46	2	-12	999	999	999			
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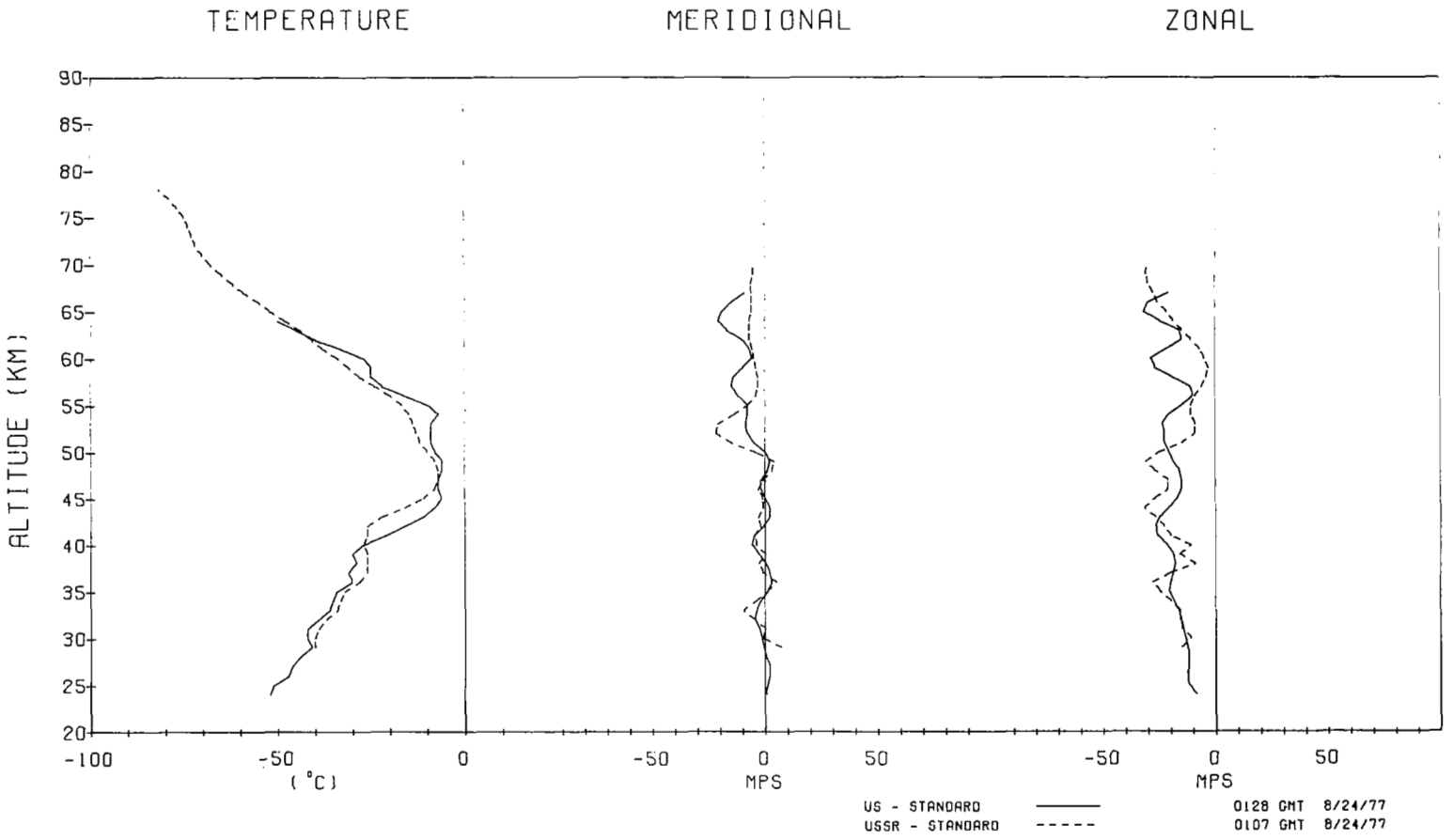
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77	999	999	999	-72	999	999			
76	999	999	999	-72	999	999			
75	999	999	999	-72	999	999			
74	999	999	999	-72	999	999			
73	999	999	999	-73	999	999			
72	999	999	999	-73	999	999			
71	999	8	1	-73	999	999			
70	-58	-1	-3	-73	-16	14	-15	-15	17
69	-54	-10	-9	-71	-17	5	-17	-7	14
68	-47	-19	-15	-70	-17	-3	-23	2	12
67	-46	-24	-19	-68	-17	-11	-22	7	8
66	-44	-25	-24	-65	-17	-17	-21	8	7
65	-42	-24	-28	-62	-17	-22	-20	7	6
64	-41	-24	-31	-58	-16	-26	-17	8	5
63	-41	-22	-32	-54	-16	-28	-13	6	4
62	-38	-16	-34	-49	-15	-30	-11	1	4
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46	-6	-3	-13	-10	-3	-21	-4	0	-8
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43	-10	2	-24	-11	7	-30	-1	5	-6
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39	-29	-6	-21	-30	-11	-17	-1	-5	4
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37	-30	1	-18	-27	4	-20	3	3	-2
36	-32	3	-19	-29	2	-21	3	-1	-2
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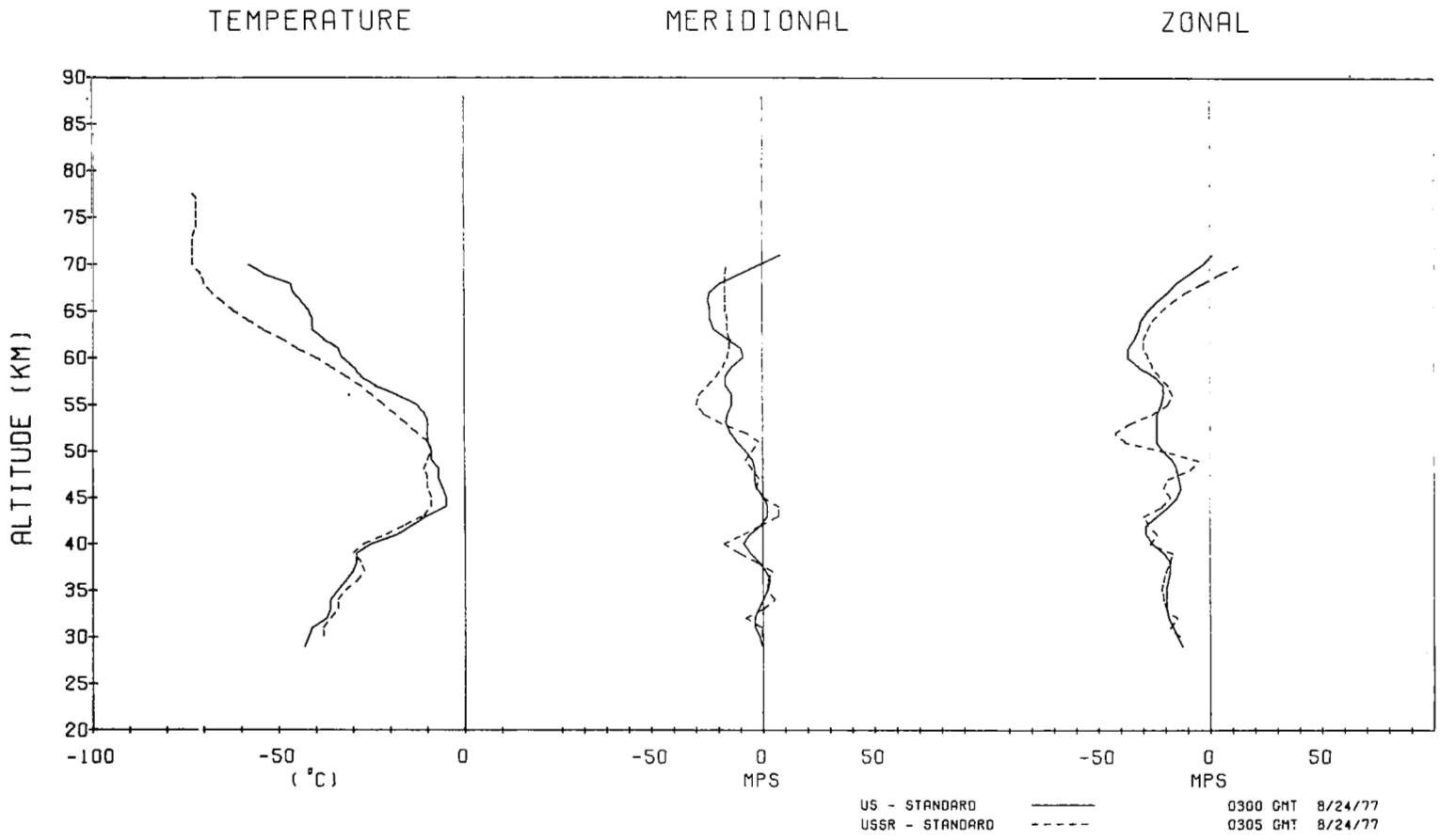
33	-36	-2	-20	-34	0	-20	2	2	0
32	-37	-4	-19	-36	-8	-15	1	-4	4
31	-41	-4	-17	-38	-1	-18	3	3	-1
30	-42	-2	-15	-38	-1	-14	4	1	1
29	-43	-1	-13	999	999	999			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ZONAL
ALTITUDE (KM)
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85
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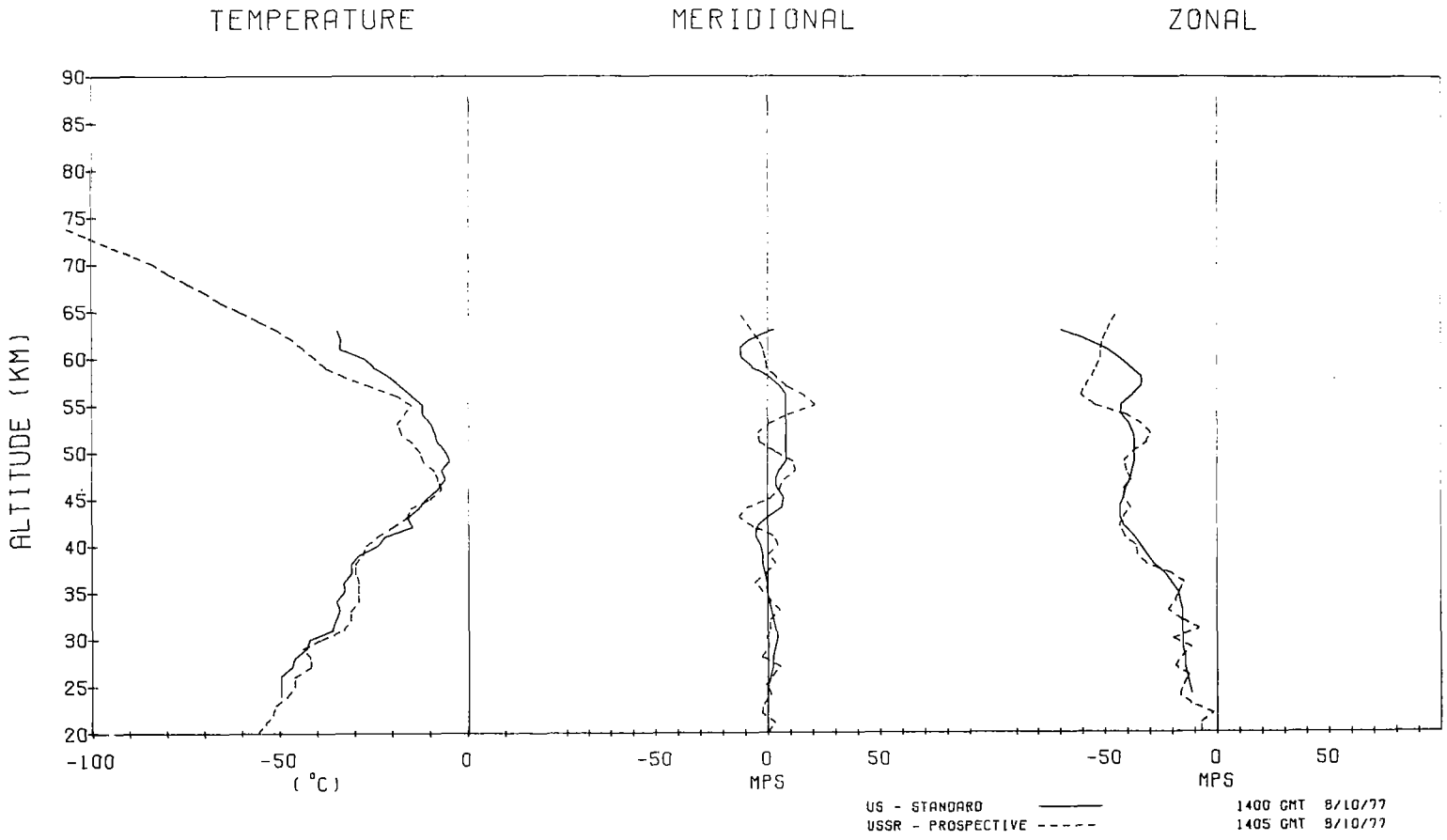
40
35
30
25
20
-100
-50
0
(°C)
-50
0
50
MPS
-50
0
50
MPS
US - STANDARD
USSR - STANDARD
0300 GMT 8/24/77
0305 GMT 8/24/77

APPENDIX B

LISTINGS AND PLOTS OF US(STANDARD) AND USSR(PROSPECTIVE) DATA

The information presented in Appendix B is similar to that presented in Appendix A with the exception that the USSR data were reduced using a proposed data reduction technique. This technique is labeled USSR(prospective) for identification.

ALT	US - STANDARD AUG 10 1977 1400 GMT			USSR - PROSPECTIVE AUG 10 1977 1405 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS M S -1		TEMP	COMPONENT WINDS M S -1		TEMP	COMPONENT WINDS M S -1	
KM	DEG C	NS	EW	DEG C	NS	EW	DEG C	NS	EW
74	999	999	999	-108	999	999			
73	999	999	999	-102	999	999			
72	999	999	999	-96	999	999			
71	999	999	999	-90	999	999			
70	999	999	999	-84	999	999			
69	999	999	999	-80	999	999			
68	999	999	999	-75	999	999			
67	999	999	999	-70	999	999			
66	999	999	999	-66	999	999			
65	999	999	999	-61	-14	-44			
64	999	999	999	-56	-11	-47			
63	-35	2	-70	-51	-8	-49	-16	-10	21
62	-34	-8	-59	-47	-5	-51	-13	3	8
61	-34	-13	-50	-44	-3	-52	-10	10	-2
60	-28	-12	-44	-41	-2	-52	-13	10	-8
59	-25	-7	-39	-38	-1	-54	-13	6	-15
58	-21	0	-34	-33	3	-56	-12	3	-22
57	-18	5	-34	-26	8	-59	-8	3	-25
56	-15	8	-38	-19	16	-61	-4	8	-23
55	-12	8	-43	-15	21	-55	-3	13	-12
54	-12	8	-43	-17	9	-41	-5	1	2
53	-10	8	-40	-19	0	-34	-9	-8	6
52	-9	8	-38	-18	-5	-30	-9	-13	8
51	-8	8	-37	-15	-4	-32	-7	-12	5
50	-6	8	-37	-13	3	-38	-7	-5	-1
49	-5	8	-37	-12	11	-42	-7	3	-5
48	-7	5	-38	-9	12	-41	-2	7	-3
47	-6	3	-39	-8	7	-39	-2	4	0
46	-8	4	-41	-7	5	-42	1	1	-1
45	-11	7	-42	-10	1	-42	1	-6	0
44	-13	6	-44	-15	-10	-39	-2	-16	5
43	-16	0	-44	-16	-13	-42	0	-13	2
42	-15	-5	-42	-20	-7	-44	-5	-2	-2
41	-22	-6	-38	-24	2	-42	-2	8	-4
40	-24	-4	-35	-27	4	-37	-3	8	-2
39	-29	-3	-32	-28	0	-36	1	3	-4
38	-31	-3	-29	-30	3	-32	1	6	-3
37	-31	-2	-24	-30	-1	-21	1	1	3
36	-33	-1	-21	-29	-6	-15	4	-5	6
35	-33	-1	-18	-29	-3	-17	4	-2	1
34	-35	0	-17	-29	1	-19	6	1	-2
33	-34	1	-16	-31	5	-22	3	4	-6
32	-35	2	-16	-31	1	-16	4	-1	0
31	-36	3	-16	-33	1	-8	3	-2	8
30	-42	4	-16	-39	-1	-20	3	-5	-4
29	-43	3	-16	-44	0	-12	-1	-3	4
28	-46	2	-15	-42	-3	-16	4	-5	-1
27	-47	2	-15	-42	5	-19	5	3	-4
26	-50	1	-14	-46	2	-13	4	1	1
25	-50	0	-13	-46	-1	-15	4	-1	-2
24	-50	-1	-12	-48	1	-17	2	2	-5
23	999	999	999	-51	-2	-12			
22	999	999	999	-52	-3	-2			
21	999	999	999	-54	3	-7			
20	999	999	999	-56	0	-7			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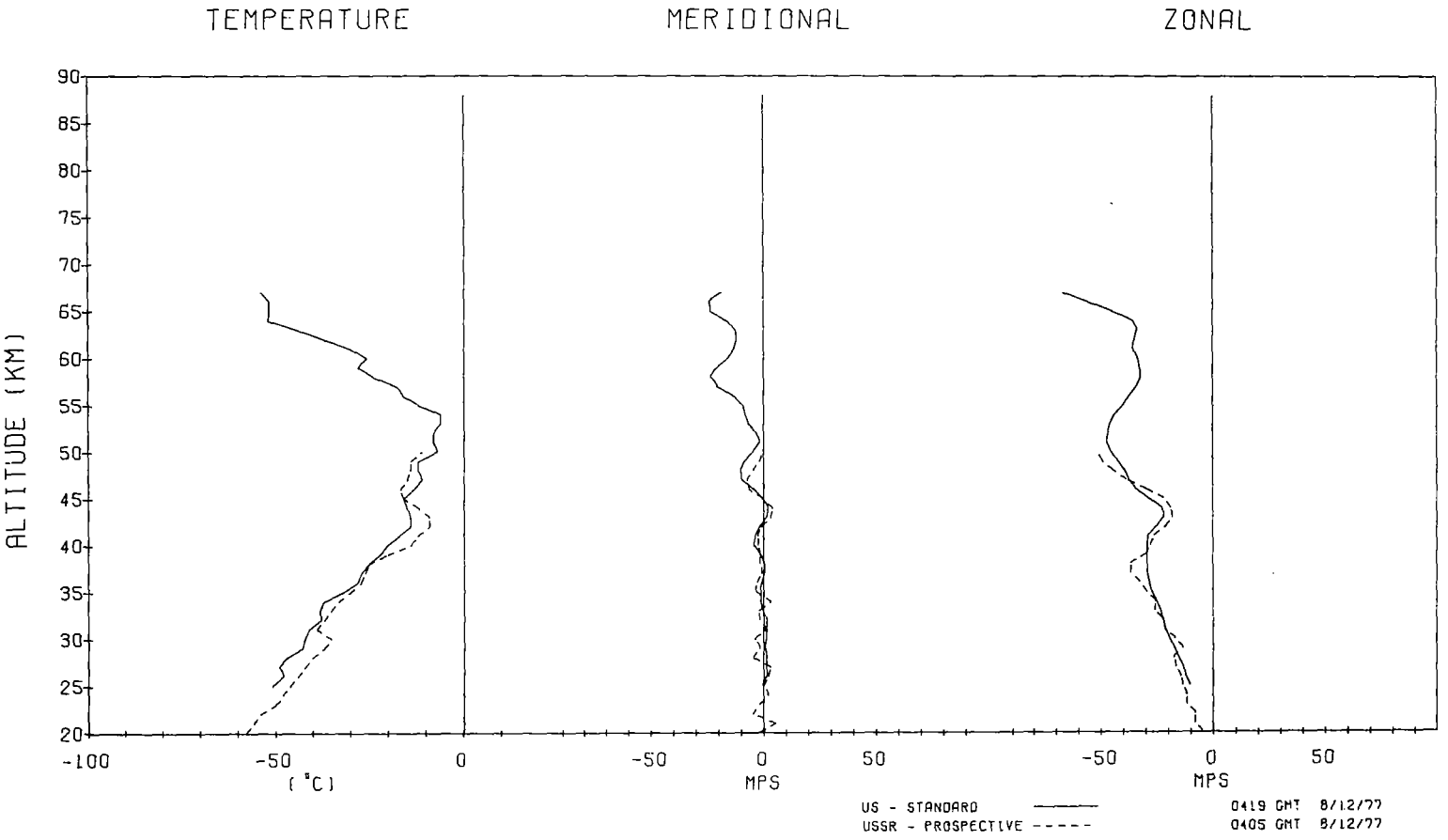
30
25
20
-100
-50
0
(°C)
-50
0
50
MPS
-50
0
50
MPS
US - STANDARD
USSR - PROSPECTIVE
1400 GMT 8/10/77
1405 GMT 8/10/77

ALT	US - STANDARD AUG 12 1977 0419 GMT			USSR - PROSPECTIVE AUG 12 1977 0405 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DLG C	M S NS	EW
67	-54	-19	-67	999	999	999			
66	-52	-25	-56	999	999	999			
65	-52	-24	-45	999	999	999			
64	-52	-17	-36	999	999	999			
63	-44	-13	-34	999	999	999			
62	-37	-12	-35	999	999	999			
61	-30	-13	-36	999	999	999			
60	-26	-16	-34	999	999	999			
59	-28	-21	-33	999	999	999			
58	-24	-24	-32	999	999	999			
57	-18	-21	-34	999	999	999			
56	-16	-14	-37	999	999	999			
55	-12	-10	-40	999	999	999			
54	-6	-9	-44	999	999	999			
53	-6	-7	-46	999	999	999			
52	-8	-4	-47	999	999	999			
51	-8	-2	-48	999	999	999			
50	-7	-5	-46	-11	0	-52	-4	5	-6
49	-12	-9	-43	-14	-2	-50	-2	7	-7
48	-12	-11	-40	-14	-5	-45	-2	6	-5
47	-11	-10	-38	-15	-8	-39	-4	2	-1
46	-13	-5	-35	-17	-7	-30	-4	-2	5
45	-16	-1	-29	-16	-1	-22	0	0	7
44	-15	2	-23	-12	4	-19	3	2	4
43	-14	1	-22	-9	3	-18	5	2	4
42	-14	-2	-25	-9	-1	-21	5	1	4
41	-17	-4	-29	-12	-3	-26	5	1	3
40	-20	-5	-30	-14	-3	-28	6	2	2
39	-22	-2	-30	-20	-2	-30	2	0	0
38	-25	0	-30	-25	-2	-37	0	-2	-7
37	-27	0	-30	-26	-1	-37	1	-1	-7
36	-28	-1	-29	-27	-3	-33	1	-2	-4
35	-32	-2	-28	-30	-4	-30	2	-2	-2
34	-37	-2	-26	-33	3	-26	4	5	0
33	-38	-1	-24	-35	-2	-26	3	-1	-2
32	-38	1	-23	-37	-2	-23	1	-3	0
31	-41	1	-22	-39	1	-22	2	0	0
30	-42	1	-20	-35	-4	-17	7	-5	3
29	-43	0	-18	-37	-2	-14	6	-2	4
28	-47	1	-16	-40	-5	-18	7	-6	-2
27	-49	1	-14	-42	3	-17	7	2	-3
26	-48	1	-13	-44	2	-15	4	1	-2
25	-51	-1	-11	-46	0	-14	5	1	-3
24	999	999	999	-48	2	-12			
23	999	999	999	-50	-2	-12			
22	999	999	999	-54	-5	-8			
21	999	999	999	-56	5	-8			
20	999	999	999	-58	-2	-5			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ZONAL
ALTITUDE (KM)
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85
80
75
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65
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35
30
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20
-100
-50
0
(°C)
-50
0
50
MPS
-50
0
50
MPS
US - STANDARD
USSR - PROSPECTIVE
0419 GMT 8/12/77
0405 GMT 8/12/77

ALT	US - STANDARD AUG 12 1977 0659 GMT			USSR - PROSPECTIVE AUG 12 1977 0605 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
76	999	999	999	-92	999	999			
75	999	999	999	-84	999	999			
74	999	999	999	-74	999	999			
73	999	999	999	-65	999	999			
72	999	999	999	-58	999	999			
71	999	999	999	-53	999	999			
70	-48	-1	-29	-51	999	999	-3		
69	-50	1	-39	-51	999	999	-1		
68	-49	-3	-50	-52	999	999	-3		
67	-51	-14	-58	-53	999	999	-2		
66	-54	-24	-61	-54	999	999	0		
65	-50	-29	-61	-54	999	999	-4		
64	-45	-28	-60	-54	999	999	-9		
63	-42	-26	-59	-53	999	999	-11		
62	-42	-26	-56	-52	999	999	-10		
61	-40	-27	-51	-50	999	999	-10		
60	-34	-26	-46	-47	-11	-21	-13	15	25
59	-32	-20	-42	-43	-8	-23	-11	12	19
58	-31	-13	-40	-38	-6	-26	-7	7	14
57	-26	-6	-39	-32	-5	-29	-6	1	10
56	-22	-4	-41	-25	-5	-33	-3	-1	8
55	-17	-4	-42	-19	-6	-36	-2	-2	6
54	-13	-7	-42	-15	-7	-35	-2	0	7
53	-11	-9	-40	-11	-8	-35	0	1	5
52	-10	-7	-39	-7	-9	-35	3	-2	4
51	-9	-4	-39	-4	-10	-36	5	-6	3
50	-7	-3	-40	-4	-10	-38	3	-7	2
49	-5	-5	-41	-5	-10	-42	0	-5	-1
48	-5	-9	-40	-6	-11	-44	-1	-2	-4
47	-3	-9	-39	-8	-12	-46	-5	-3	-7
46	-10	-4	-38	-12	-12	-48	-2	-8	-10
45	-11	-1	-36	-15	-11	-47	-4	-10	-11
44	-10	0	-33	-14	-5	-41	-4	-5	-8
43	-10	0	-30	-15	2	-34	-5	2	-4

ALT	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
42	-12	1	-29	-13	3	-31	-1	2	-2
41	-15	2	-31	-18	2	-29	-3	0	2
40	-20	2	-32	-24	0	-28	-4	-2	4
39	-25	1	-30	-26	0	-25	-1	-1	5
38	-29	1	-29	-28	4	-24	1	3	5
37	-31	0	-29	-27	0	-27	4	0	2
36	-33	-1	-29	-30	-8	-30	3	-7	-1
35	-33	-2	-27	-32	-5	-31	1	-3	-4
34	-35	-1	-24	-34	-4	-25	1	-3	-1
33	-39	-2	-21	-37	-7	-24	2	-5	-3
32	-39	-2	-19	-38	-7	-21	1	-5	-2
31	-41	-1	-18	-42	-1	-18	-1	0	0
30	-41	0	-17	-40	1	-17	1	1	0
29	-41	1	-16	-40	-2	-20	1	-3	-4
28	-44	2	-15	-42	1	-17	2	-1	-2
27	-47	2	-14	-47	4	-14	0	2	0
26	-47	2	-14	-49	3	-16	-2	1	-2
25	-49	0	-14	-50	1	-14	-1	1	0
24	-50	0	-13	-51	-3	-10	-1	-3	3
23	999	999	999	-53	2	-11			
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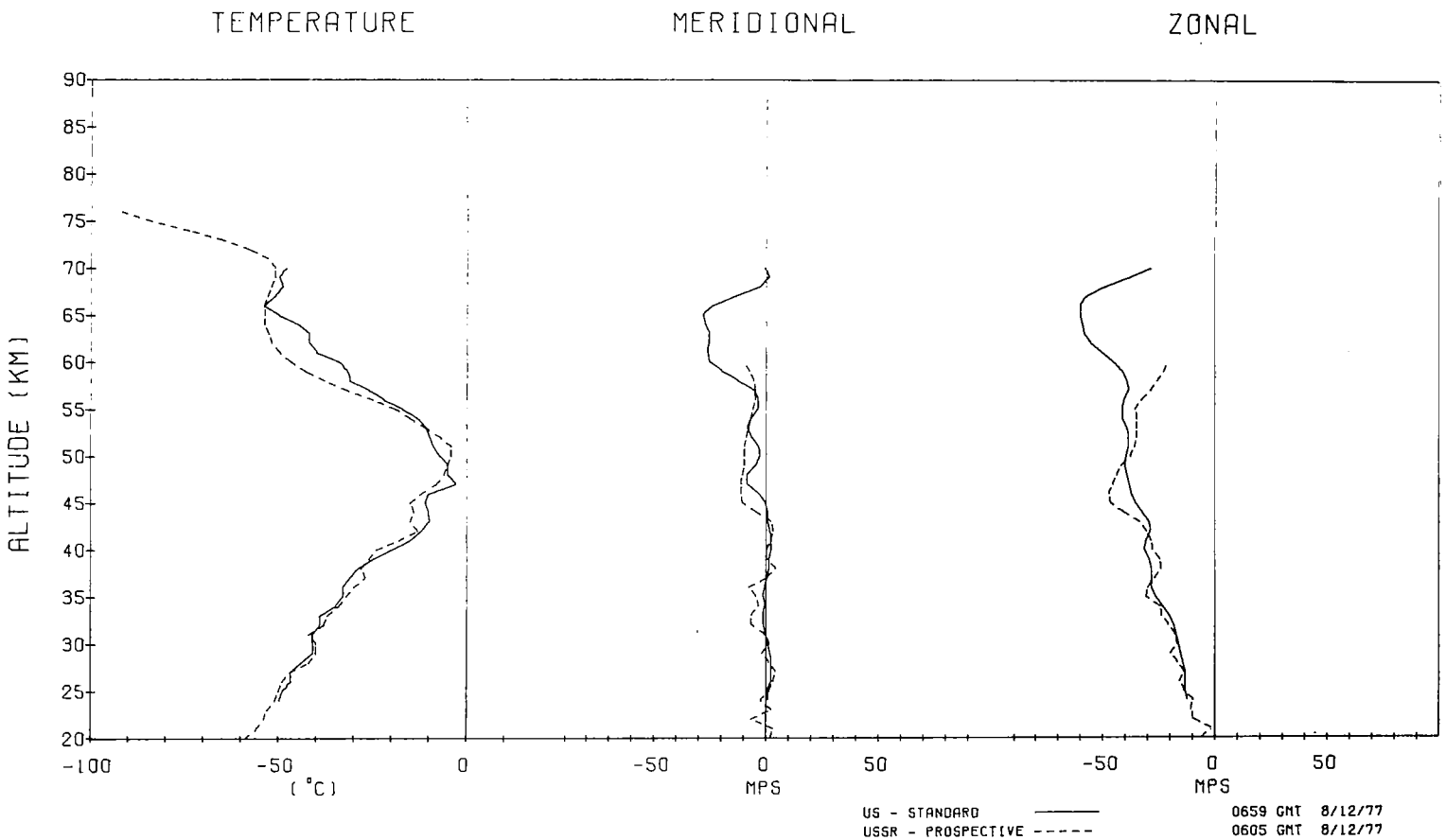
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ZONAL
ALTITUDE (KM)
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80
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35
30
25
20
-100
-50
0
(°C)
-50
0
50
MPS
-50
0
50
MPS
US - STANDARD
USSR - PROSPECTIVE
0659 GMT 8/12/77
0605 GMT 8/12/77

ALT	US - STANDARD AUG 12 1977 1100 GMT			USSR - PROSPECTIVE AUG 12 1977 1105 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
74	999	999	999	-101	999	999			
73	999	999	999	-93	999	999			
72	999	999	999	-84	999	999			
71	999	999	999	-76	999	999			
70	999	999	999	-70	999	999			
69	999	999	999	-66	999	999			
68	999	999	999	-65	999	999			
67	-45	-1	-17	-66	999	999	-21		
66	-39	4	-24	-66	999	999	-27		
65	-39	8	-31	-66	999	999	-27		
64	-40	8	-39	-63	999	999	-23		
63	-37	6	-44	-59	999	999	-22		
62	-33	5	-47	-53	-11	-37	-20	-16	10
61	-29	6	-48	-46	-6	-46	-17	-12	2
60	-29	8	-47	-38	0	-52	-9	-8	-5
59	-24	8	-44	-31	6	-56	-7	-2	-12
58	-21	7	-40	-25	9	-54	-4	2	-14
57	-18	9	-36	-21	7	-49	-3	-2	-13
56	-14	11	-36	-18	0	-42	-4	-11	-6
55	-10	11	-39	-16	-6	-37	-6	-17	2
54	-9	6	-45	-14	-8	-37	-5	-14	8
53	-7	-2	-50	-13	-6	-40	-6	-4	10
52	-8	-9	-51	-12	-7	-43	-4	2	8
51	-7	-12	-50	-12	-9	-45	-5	3	5
50	-6	-9	-47	-13	-9	-46	-7	0	1
49	-12	-3	-46	-15	-7	-44	-3	-4	2
48	-11	2	-47	-15	-1	-40	-4	-3	7
47	-10	4	-46	-15	5	-36	-5	1	10
46	-12	4	-42	-16	7	-34	-4	3	8
45	-15	2	-35	-17	4	-35	-2	2	0
44	-16	-3	-31	-17	-3	-35	-1	0	-4
43	-15	-6	-30	-15	-8	-34	0	-2	-4
42	-16	-6	-31	-17	-8	-32	-1	-2	-1
41	-19	-4	-30	-20	-4	-29	-1	0	1
40	-23	-2	-27	-23	-2	-27	0	0	0
39	-25	-1	-23	-24	-6	-30	1	-5	-7
38	-27	1	-21	-26	-11	-25	1	-12	-4
37	-30	3	-19	-29	-1	-16	1	-4	3
36	-30	4	-19	-31	9	-17	-1	5	2
35	-31	3	-20	-30	5	-23	1	2	-3
34	-34	0	-21	-32	-1	-23	2	-1	-2
33	-34	-1	-23	-32	-1	-24	2	0	-1
32	-36	-2	-23	-35	2	-26	1	4	-3
31	-39	-1	-22	-36	-2	-27	3	-1	-5
30	-45	-1	-20	-45	-1	-18	0	0	2
29	-45	-1	-17	-49	-3	-19	-4	-2	-2
28	-44	-1	-15	-45	-4	-15	-1	-3	0
27	-45	-1	-12	-43	-2	-11	2	-1	1
26	-45	0	-11	-43	-2	-11	2	-2	0
25	-48	2	-12	-47	2	-14	1	0	-2
24	-51	1	-11	-50	1	-11	1	0	0
23	999	999	999	-51	-4	-10			
22	999	999	999	-55	2	-9			
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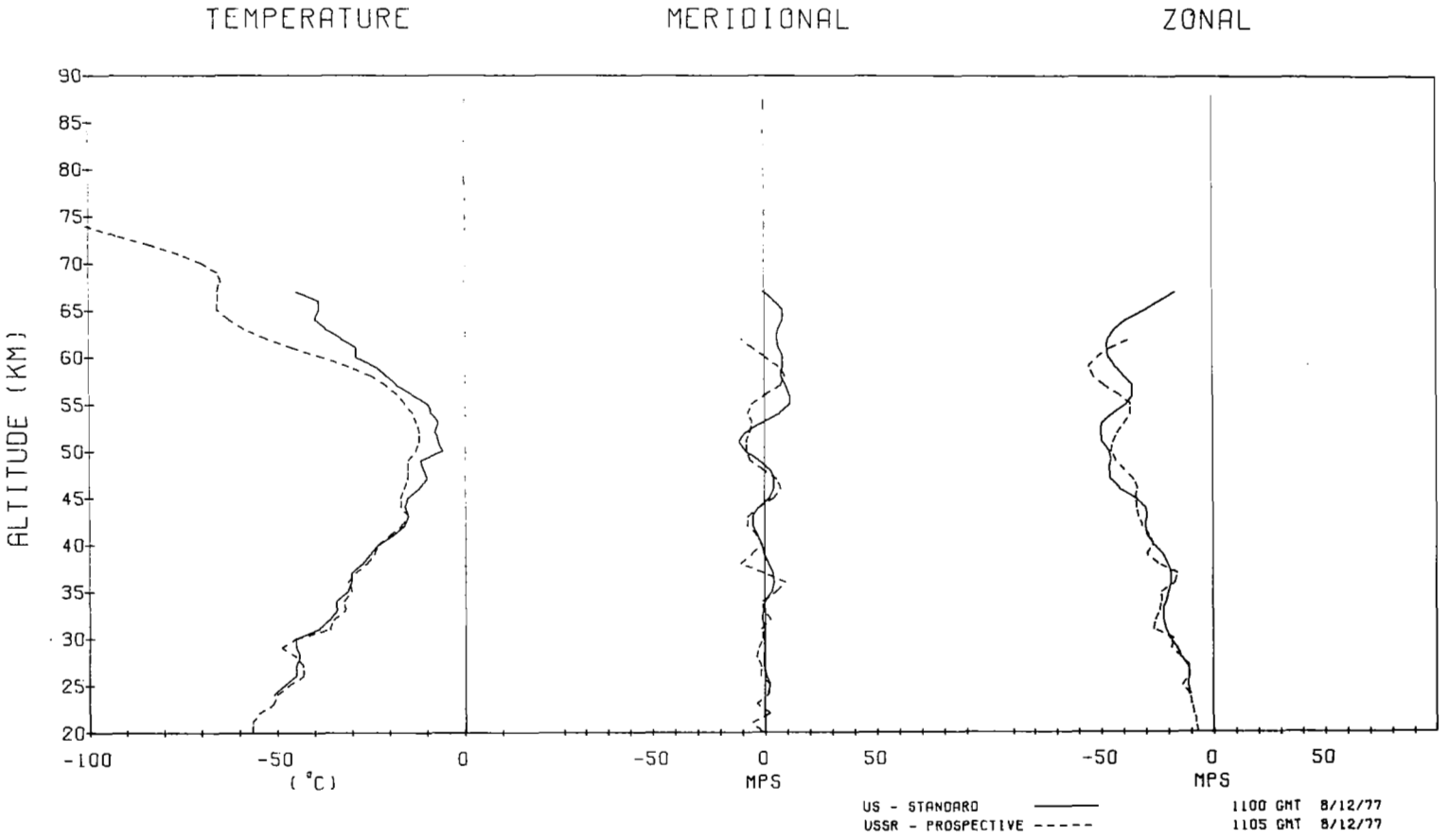
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ZONAL
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-50
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(°C)
-50
0
50
MPS
-50
0
50
MPS
US - STANDARD
USSR - PROSPECTIVE
1100 GMT 8/12/77
1105 GMT 8/12/77

ALT	US - STANDARD AUG 15 1977 1744 GMT			USSR - PROSPECTIVE AUG 12 1977 1735 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
72	999	999	999	-48	999	999			
71	999	999	999	-44	999	999			
70	999	999	999	-41	999	999			
69	999	999	999	-38	999	999			
68	-48	-16	-61	-36	999	999	12		
67	-47	-12	-58	-35	999	999	12		
66	-45	-10	-53	-34	999	999	11		
65	-42	-6	-49	-34	999	999	8		
64	-39	3	-47	-34	999	999	5		
63	-36	13	-50	-34	999	999	2		
62	-34	19	-52	-33	999	999	1		
61	-31	16	-50	-32	999	999	-1		
60	-28	8	-42	-30	-7	-19	-2	-15	23
59	-24	1	-33	-28	-2	-21	-4	-3	12
58	-19	1	-27	-24	2	-23	-5	1	4
57	-14	7	-28	-21	5	-25	-7	-2	3
56	-10	14	-33	-17	7	-27	-7	-7	6
55	-9	17	-38	-15	8	-30	-6	-9	8
54	-8	14	-42	-15	8	-34	-7	-6	8
53	-5	9	-42	-17	9	-36	-12	0	6
52	-3	8	-39	-16	12	-40	-13	4	-1
51	-4	10	-36	-11	16	-43	-7	6	-7
50	-4	12	-34	-4	20	-42	0	8	-8
49	-2	12	-35	-3	18	-38	-1	6	-3
48	-1	9	-36	-4	12	-32	-3	3	4
47	0	6	-35	-5	6	-30	-5	0	5
46	1	3	-33	-5	4	-31	-6	1	2
45	1	1	-31	-7	3	-32	-8	2	-1
44	0	0	-30	-7	4	-33	-7	4	-3
43	-6	2	-28	-7	6	-36	-1	4	-8
42	-15	4	-25	-15	4	-29	0	0	-4
41	-16	7	-22	-20	4	-21	-4	-3	1
40	-17	8	-21	-19	8	-20	-2	0	1
39	-19	7	-21	-20	11	-27	-1	4	-6
38	-21	5	-21	-25	4	-27	-4	-1	-6
37	-23	2	-20	-25	0	-22	-2	-2	-2
36	-24	1	-17	-24	2	-19	0	1	-2
35	-24	0	-16	-27	0	-17	-3	0	-1
34	-27	2	-15	-31	2	-17	-4	0	-2
33	-30	4	-16	-33	7	-16	-3	3	0
32	-31	4	-17	-35	4	-18	-4	0	-1
31	-35	3	-17	-37	0	-18	-2	-3	-1
30	-38	1	-16	-38	0	-17	0	-1	-1
29	-38	1	-16	-42	0	-15	-4	-1	1
28	-40	0	-15	-41	2	-14	-1	2	1
27	-41	0	-14	-42	-3	-16	-1	-3	-2
26	-44	0	-13	-45	0	-15	-1	0	-2
25	-45	0	-11	-48	-1	-14	-3	-1	-3
24	-45	0	-7	-48	-4	-8	-3	-4	-1
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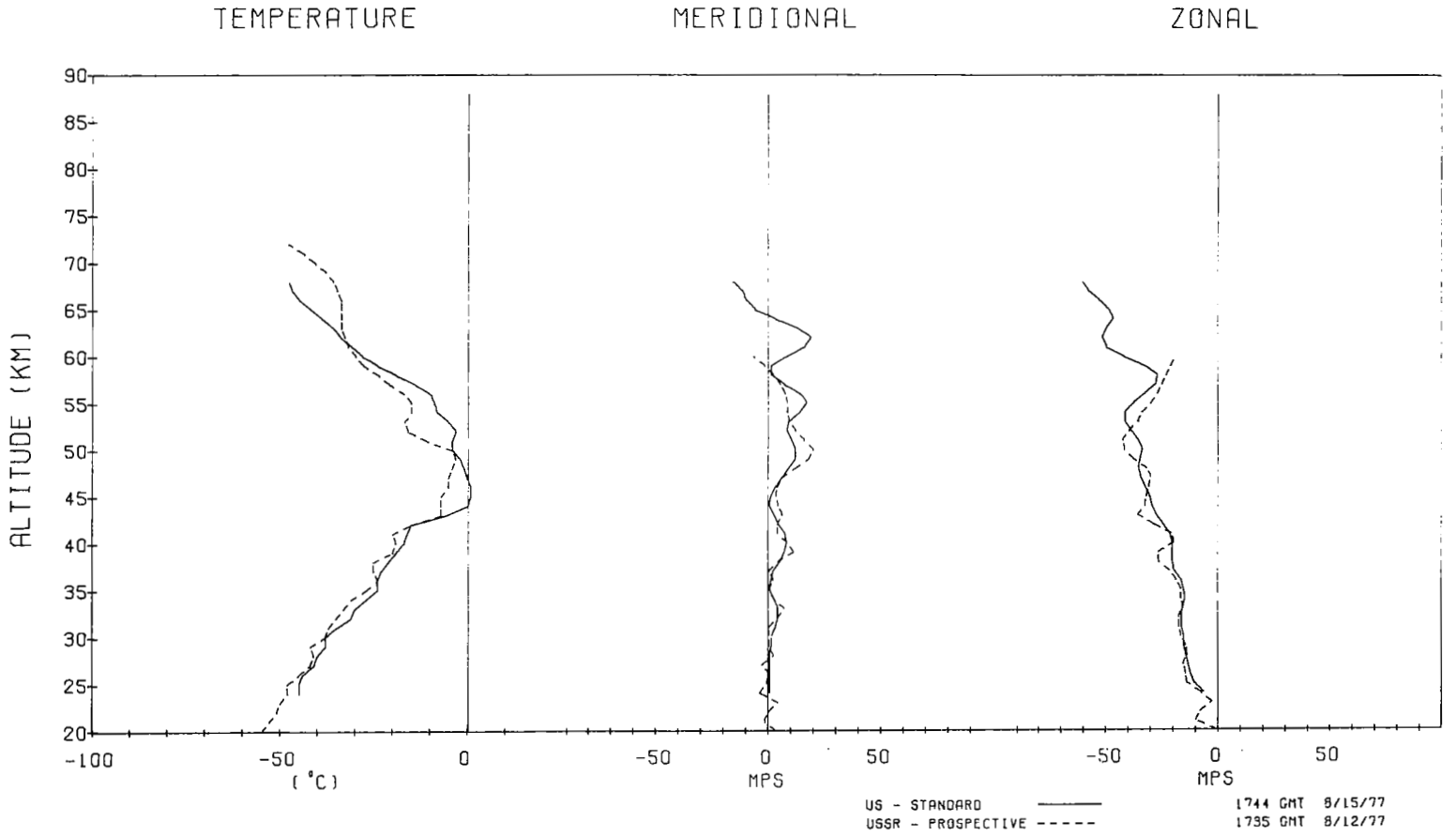
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-50
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(°C)
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50
MPS
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USSR - PROSPECTIVE
1744 GMT 8/15/77
1735 GMT 8/12/77

ALT	US - STANDARD AUG 15 1977 1930 GMT			USSR - PROSPECTIVE AUG 15 1977 1935 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
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73	999	28	-13	-83	999	999			
72	999	28	-27	-79	999	999			
71	999	20	-40	-75	999	999			
70	-61	7	-49	-72	999	999	-11		
69	-58	-2	-50	-68	999	999	-10		
68	-51	-1	-47	-64	999	999	-13		
67	-45	3	-44	-61	999	999	-16		
66	-39	4	-43	-57	999	999	-18		
65	-39	0	-40	-53	999	999	-14		
64	-39	0	-36	-50	7	-32	-11	7	4
63	-34	5	-35	-47	9	-34	-13	4	1
62	-31	11	-38	-44	9	-36	-13	-2	2
61	-31	12	-42	-40	8	-36	-9	-4	6
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56	-14	5	-33	-17	-10	-39	-3	-15	-6
55	-13	12	-34	-17	-6	-41	-4	-18	-7
54	-11	15	-37	-16	2	-44	-5	-13	-7
53	-8	14	-38	-14	7	-46	-6	-7	-8
52	-5	13	-38	-10	9	-44	-5	-4	-6
51	-3	13	-37	-10	9	-40	-7	-4	-3
50	-4	13	-35	-13	8	-35	-9	-5	0
49	-2	13	-36	-11	8	-36	-9	-5	0
48	-5	13	-38	-7	9	-44	-2	-4	-6
47	-4	10	-39	-7	8	-48	-3	-2	-9
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45	-4	0	-36	-7	3	-33	-3	3	3
44	-5	-3	-32	-6	0	-29	-1	3	3
43	-12	-1	-26	-18	1	-27	-6	2	-1
42	-21	3	-22	-25	7	-23	-4	4	-1
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39	-23	7	-18	-25	10	-19	-2	3	-1
38	-25	5	-19	-27	6	-23	-2	1	-4
37	-26	3	-19	-28	3	-25	-2	0	-6
36	-28	0	-18	-29	0	-21	-1	0	-3
35	-31	-1	-16	-34	-5	-20	-3	-4	-4
34	-35	1	-14	-35	-1	-14	0	-2	0
33	-36	4	-13	-37	1	-7	-1	-3	6
32	-38	5	-14	-37	3	-14	1	-2	0
31	-39	4	-15	-40	-1	-18	-1	-5	-3
30	-42	2	-16	-44	-3	-16	-2	-5	0
29	-44	1	-17	-46	-8	-22	-2	-9	-5
28	-44	1	-16	-45	1	-18	-1	0	-2
27	-48	1	-14	-48	1	-12	0	0	2
26	-50	1	-12	-49	3	-11	1	2	1
25	-51	1	-10	-50	2	-8	1	1	2
24	999	999	999	-50	-2	-8			
23	999	999	999	-53	-1	-5			
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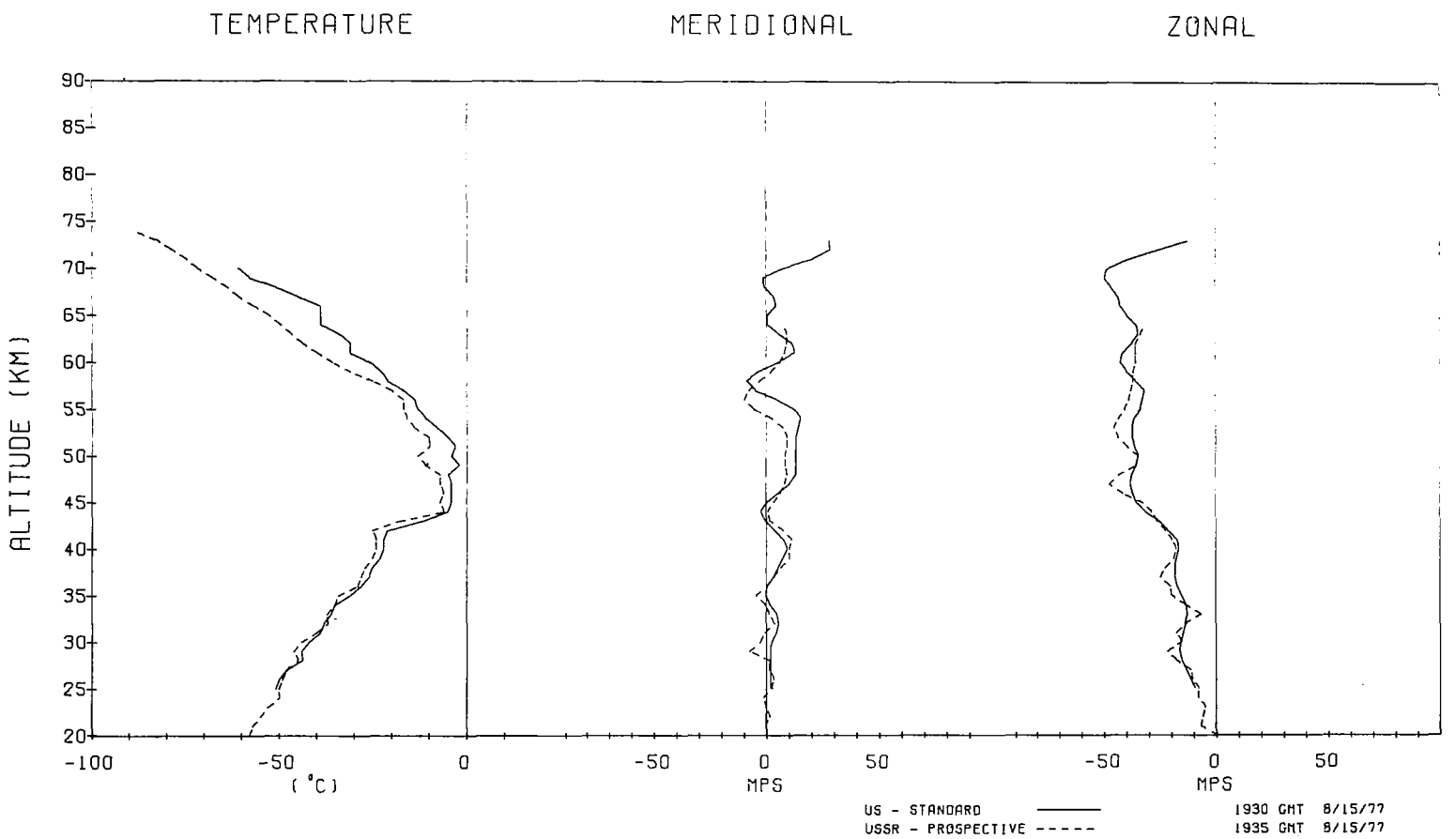
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(°C)
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MPS
US - STANDARD
USSR - PROSPECTIVE -----
1930 GMT 8/15/77
1935 GMT 8/15/77

ALT	US - STANDARD AUG 16 1977 0113 GMT			USSR - PROSPECTIVE AUG 16 1977 0105 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS -1 M S		TEMP	COMPONENT WINDS -1 M S		TEMP	COMPONENT WINDS -1 M S	
KM	DEG C	NS	EW	DEG C	NS	EW	DEG C	NS	EW
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71	999	-1	-2	999	999	999			
70	-47	11	-13	999	999	999			
69	-41	12	-25	999	999	999			
68	-39	3	-35	999	999	999			
67	-48	-7	-41	999	999	999			
66	-52	-11	-41	999	-26	-9		-15	32
65	-52	-10	-33	-60	-24	-13	-8	-14	20
64	-48	-8	-24	-52	-23	-13	-4	-15	11
63	-44	-7	-18	-45	-21	-16	-1	-14	2
62	-38	-5	-18	-40	-18	-19	-2	-13	-1
61	-34	-2	-24	-35	-13	-23	-1	-11	1
60	-30	-1	-33	-30	-9	-26	0	-8	7
59	-25	-2	-39	-23	-3	-30	2	-1	9
58	-22	-2	-40	-15	3	-35	7	5	5
57	-18	1	-38	-8	9	-40	10	8	-2
56	-14	5	-36	-4	12	-43	10	7	-7
55	-9	9	-36	-4	12	-42	5	3	-6
54	-6	9	-36	-6	7	-36	0	-2	0
53	-3	4	-36	-6	0	-33	-3	-4	3
52	-1	-5	-36	-3	-2	-35	-2	3	1
51	-3	-10	-34	1	-1	-40	4	9	-6
50	-4	-12	-33	3	0	-41	7	12	-8
49	-5	-10	-31	0	-1	-39	5	9	-8
48	-7	-7	-29	-3	-2	-35	4	5	-6
47	-9	-4	-26	-5	-5	-30	4	-1	-4
46	-9	0	-21	-7	-9	-25	2	-9	-4
45	-9	2	-20	-9	-8	-23	0	-10	-3
44	-6	2	-24	-8	0	-24	-2	-2	0
43	-12	0	-29	-9	4	-29	3	4	0
42	-17	-2	-31	-16	-2	-31	1	0	0
41	-18	-4	-28	-19	-5	-28	-1	-1	0
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39	-23	-2	-19	-20	-6	-22	3	-4	-3
38	-24	0	-17	-20	-3	-20	4	-3	-3
37	-25	1	-18	-23	-2	-20	2	-3	-2
36	-29	1	-22	-28	2	-24	1	1	-2
35	-32	-1	-24	-32	3	-27	0	4	-3
34	-36	-4	-23	-34	-2	-24	2	2	-1
33	-40	-4	-19	-36	-10	-16	4	-6	3
32	-41	-3	-16	-36	-4	-11	5	-1	5
31	-40	-1	-16	-36	1	-17	4	2	-1
30	-41	-1	-15	-37	-3	-17	4	-2	-2
29	-45	-1	-14	-40	-2	-12	5	-1	2
28	-45	0	-13	-42	4	-13	3	4	0
27	-47	1	-13	-43	-2	-16	4	-3	-3
26	-49	0	-12	-47	-3	-13	2	-3	-1
25	999	999	999	-48	-2	-12			
24	999	999	999	-49	-1	-12			
23	999	999	999	-49	-3	-9			
22	999	999	999	-53	0	-9			
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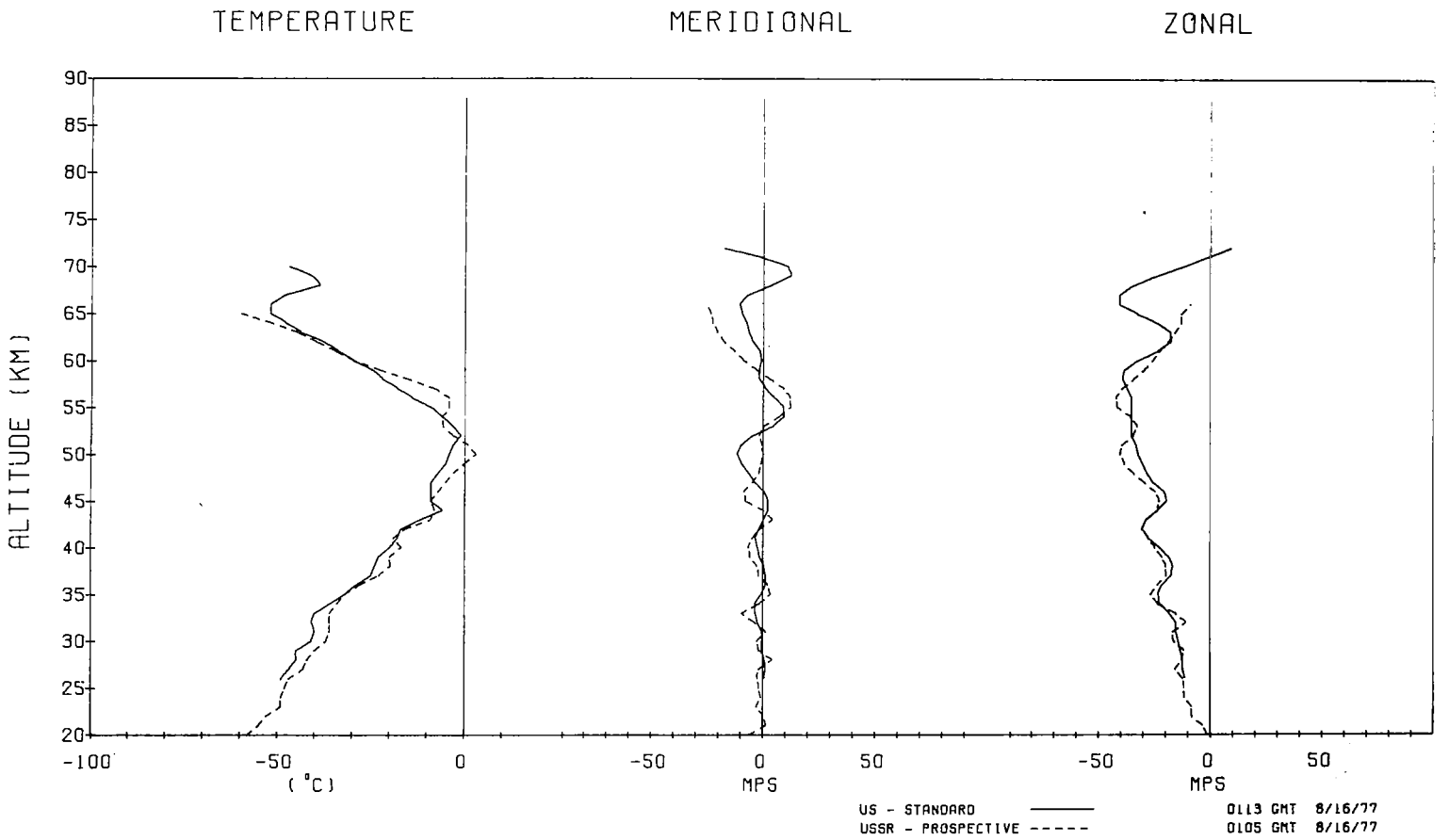
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(°C)
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0113 GMT 8/16/77
0105 GMT 8/16/77

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79	999	999	999	-101	999	999			
78	999	999	999	-94	999	999			
77	999	999	999	-90	999	999			
76	999	999	999	-87	999	999			
75	999	999	999	-84	999	999			
74	999	999	999	-81	999	999			
73	999	999	999	-78	999	999			
72	999	999	999	-74	999	999			
71	999	999	999	-69	999	999			
70	-58	-16	-47	-64	-31	-16	-6	-15	31
69	-58	-28	-47	-59	-25	-16	-1	3	31
68	-52	-35	-44	-55	-20	-15	-3	15	29
67	-45	-35	-38	-51	-16	-15	-6	19	23
66	-43	-26	-30	-48	-13	-15	-5	13	15
65	-40	-18	-23	-46	-9	-15	-6	9	8
64	-40	-13	-18	-44	-6	-16	-4	7	2
63	-42	-9	-16	-42	-3	-18	0	6	-2
62	-37	-2	-18	-40	0	-21	-3	2	-3
61	-33	5	-24	-38	2	-25	-5	-3	-1
60	-30	10	-34	-34	4	-30	-4	-6	4
59	-26	11	-45	-30	6	-35	-4	-5	10
58	-22	9	-53	-26	7	-42	-4	-2	11
57	-20	7	-55	-21	7	-48	-1	0	7
56	-17	4	-53	-17	7	-53	0	3	0
55	-16	2	-49	-14	5	-55	2	3	-6
54	-14	-1	-45	-13	3	-52	1	4	-7
53	-11	-3	-42	-11	1	-45	0	4	-3
52	-12	-2	-41	-9	0	-40	3	2	1
51	-10	1	-39	-7	2	-36	3	1	3
50	-9	5	-35	-5	5	-32	4	0	3
49	-7	9	-31	-3	7	-28	4	-2	3
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44	-10	1	-33	-8	1	-34	2	0	-1
43	-13	-1	-30	-8	-4	-31	5	-3	-1
42	-18	0	-26	-12	-3	-27	6	-3	-1
41	-18	3	-23	-14	8	-20	4	5	3
40	-19	5	-20	-17	10	-19	2	5	1
39	-21	6	-19	-20	8	-19	1	2	0
38	-22	4	-20	-21	6	-22	1	2	-2
37	-26	1	-20	-24	-4	-24	2	-5	-4
36	-31	-1	-17	-27	-3	-16	4	-2	1
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34	-34	2	-13	-32	4	-15	2	2	-2
33	-36	4	-14	-34	3	-27	2	-1	-13
32	-35	5	-16	-35	4	-20	0	-1	-4
31	-39	3	-17	-37	4	-21	2	1	-4
30	-42	1	-19	-37	0	-20	5	-1	-1
29	-43	0	-18	-41	-4	-14	2	-4	4
28	-45	-1	-17	-43	-4	-16	2	-3	1
27	-47	-1	-14	-46	-3	-15	1	-2	-1
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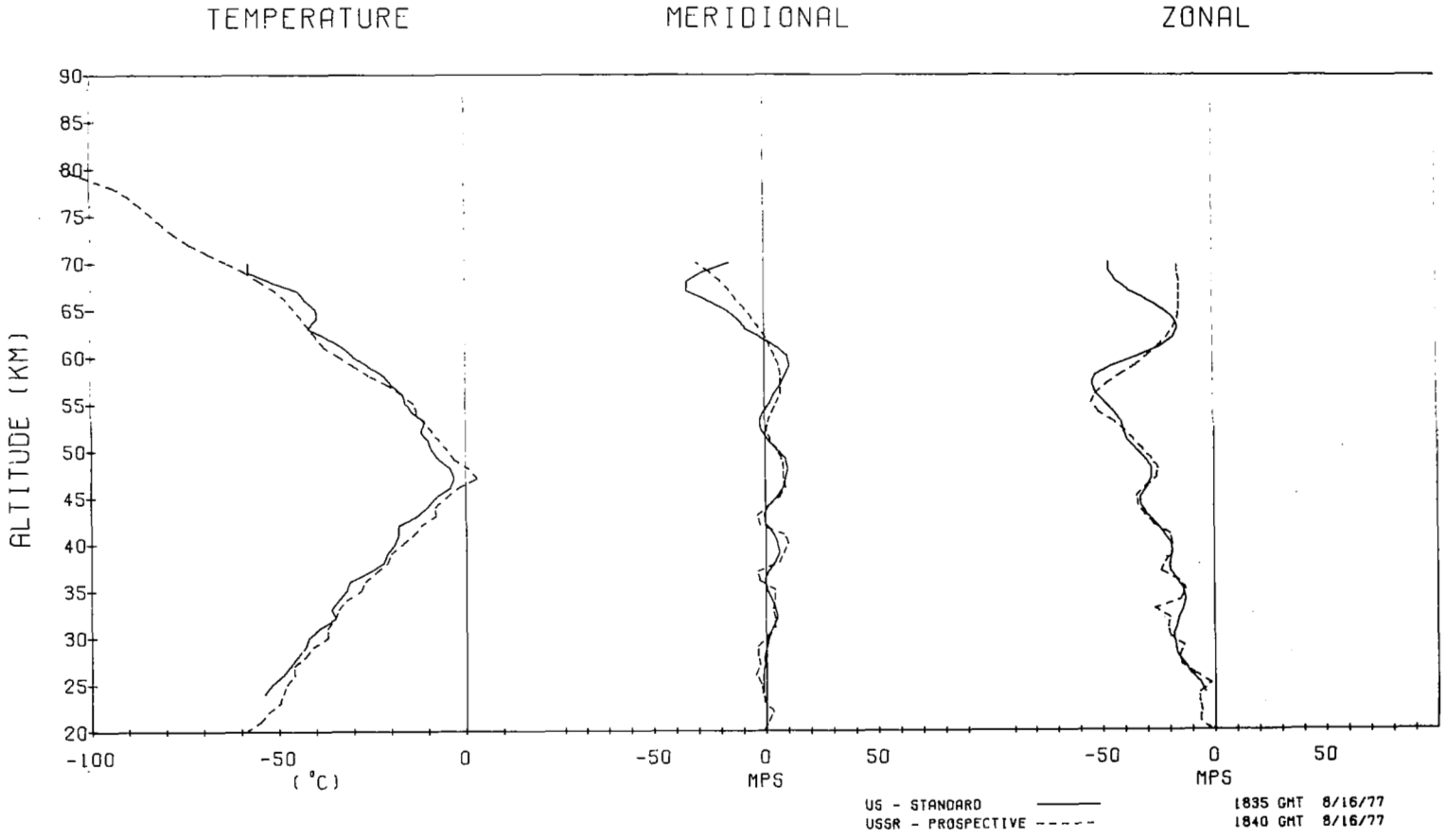
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1835 GMT 8/16/77
1840 GMT 8/16/77

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KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
72	999	-17	-15	999	999	999			
71	999	-8	-27	999	999	999			
70	-58	-2	-39	999	999	999			
69	-55	-2	-47	999	999	999			
68	-49	-7	-47	999	999	999			
67	-45	-11	-42	999	999	999			
66	-42	-13	-36	999	999	999			
65	-37	-17	-31	999	999	999			
64	-36	-23	-26	999	6	-16		29	10
63	-33	-24	-22	999	6	-19		30	3
62	-32	-14	-20	999	6	-20		20	0
61	-31	1	-21	999	5	-22		4	-1
60	-28	15	-26	999	4	-24		-11	2
59	-23	20	-33	999	2	-26		-18	7
58	-21	18	-41	999	1	-28		-17	13
57	-16	13	-44	999	0	-30		-13	14
56	-14	9	-45	999	-1	-33		-10	12
55	-11	6	-43	999	-2	-36		-8	7
54	-9	4	-42	-9	-3	-37	0	-7	5
53	-6	1	-40	-4	-4	-35	2	-5	5
52	-5	-3	-38	-5	-4	-34	0	-1	4
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50	-5	-4	-32	-10	-2	-35	-5	2	-3
49	-4	-1	-30	-8	1	-38	-4	2	-8
48	-3	1	-28	-9	3	-39	-6	2	-11
47	-2	4	-28	-13	5	-37	-11	1	-9
46	-4	6	-29	-14	7	-33	-10	1	-4
45	-7	6	-32	-10	7	-32	-3	1	0
44	-8	5	-34	-9	6	-33	-1	1	1
43	-9	3	-33	-10	4	-32	-1	1	1
42	-14	3	-28	-12	2	-28	2	-1	0
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37	-24	2	-21	-28	3	-25	-4	1	-4
36	-27	-1	-20	-28	-5	-23	-1	-4	-3
35	-30	-3	-16	-31	-10	-17	-1	-7	-1
34	-32	-2	-14	-32	-7	-13	0	-5	1
33	-34	1	-14	-33	-2	-12	1	-3	2
32	-36	3	-16	-34	2	-15	2	-1	1
31	-38	4	-17	-33	6	-18	5	2	-1
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28	-44	1	-16	-40	0	-16	4	-1	0
27	-45	1	-15	-41	0	-15	4	-1	0
26	-47	0	-13	-43	0	-14	4	0	-1
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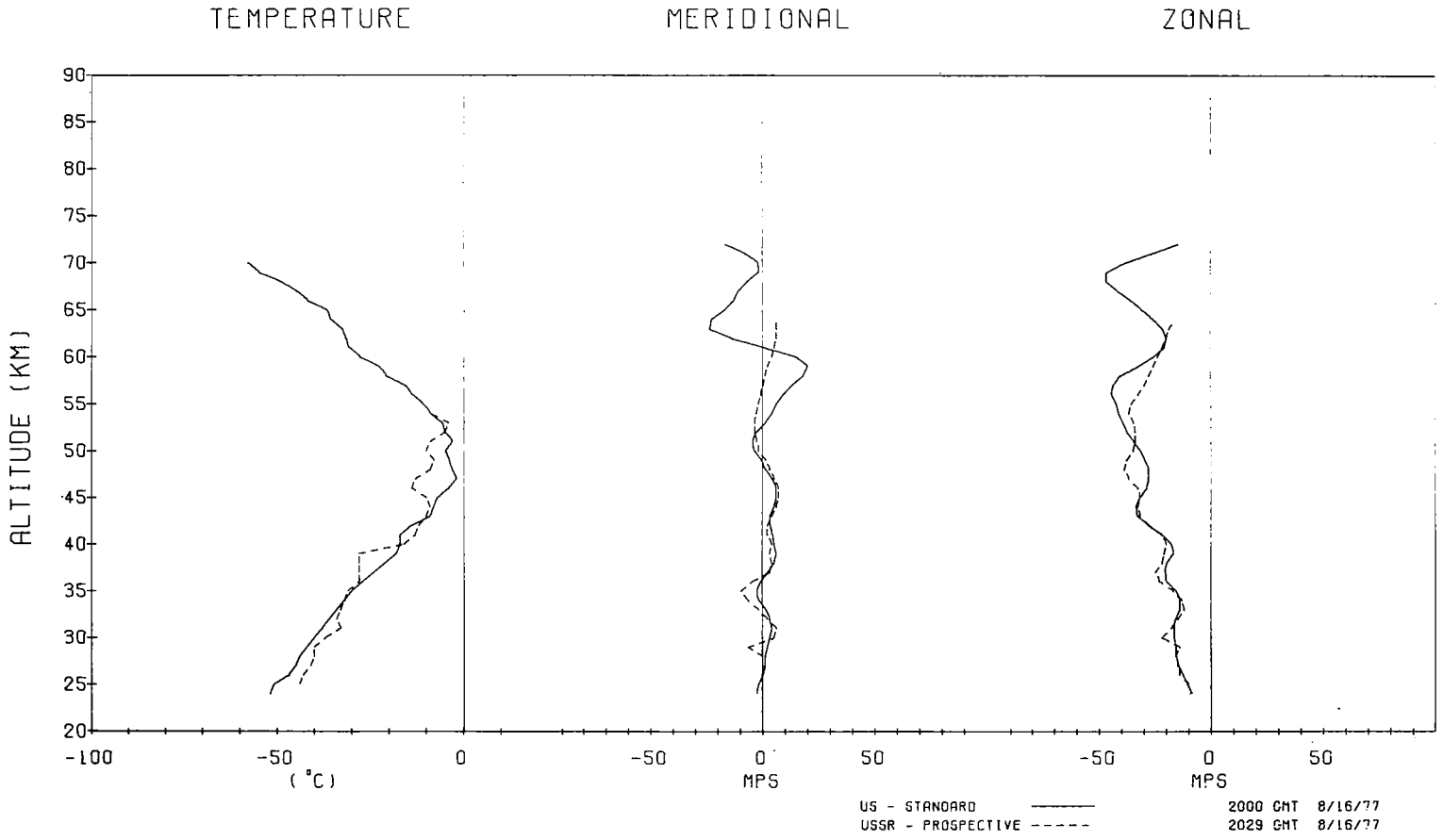
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KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
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57	-10	22	-22	-33	999	999	-23		
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44	-5	10	-21	-9	9	-19	-4	-1	2
43	-7	6	-23	-11	8	-19	-4	2	4
42	-10	3	-24	-13	4	-20	-3	1	4
41	-13	1	-23	-13	-1	-22	0	-2	1
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39	-23	0	-17	-25	-4	-23	-2	-4	-6
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33	-32	1	-13	-33	1	-13	-1	0	0
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29	999	999	999	-44	-2	-12			
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23	999	999	999	-47	-3	-8			
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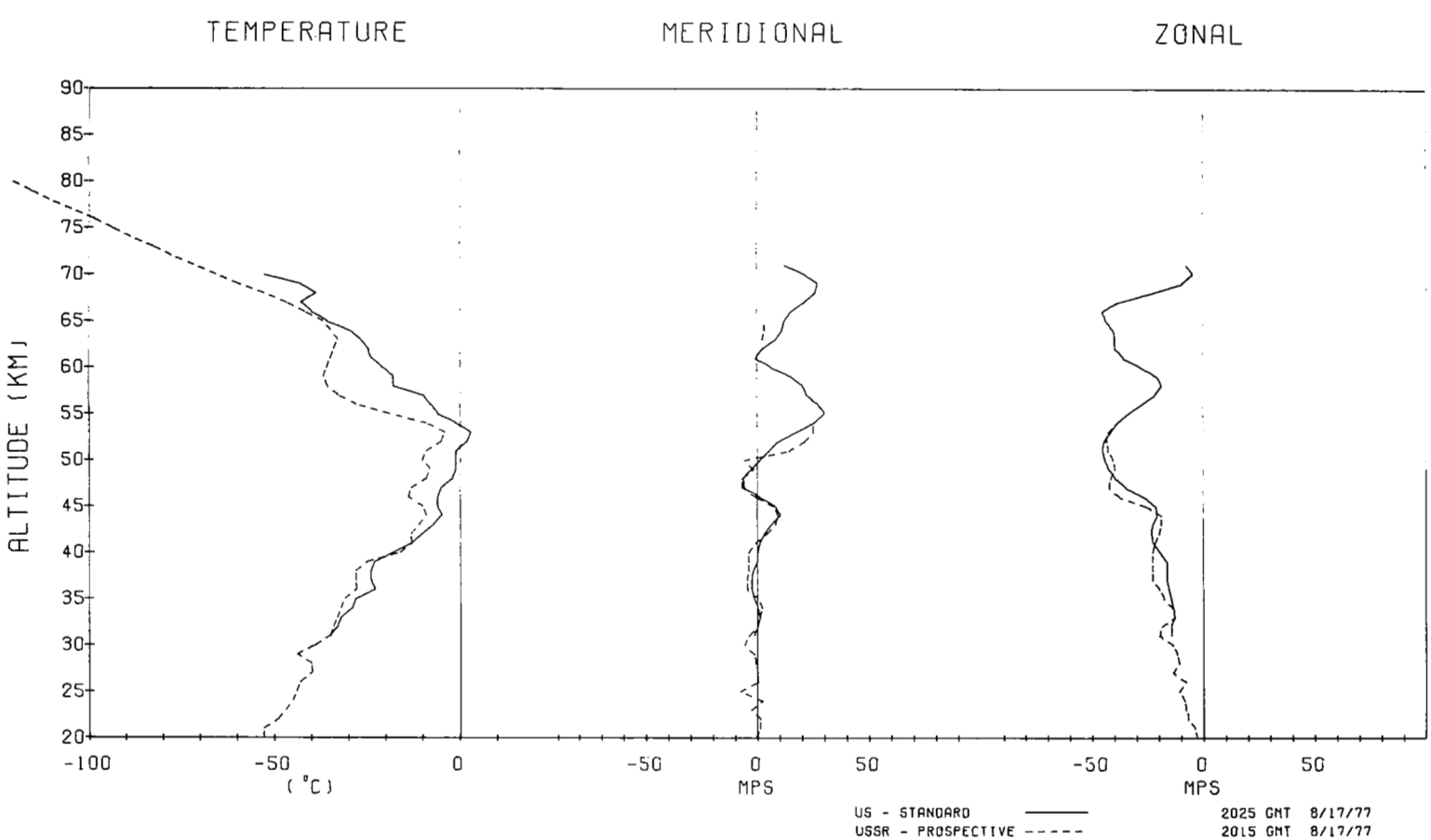
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2025 GMT 8/17/77
2015 GMT 8/17/77

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ALT	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
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77	999	999	999	-88	999	999			
76	999	999	999	-88	999	999			
75	999	999	999	-87	999	999			
74	999	999	999	-86	999	999			
73	999	999	999	-84	999	999			
72	999	-9	-20	-82	999	999			
71	999	-8	-21	-81	999	999			
70	-64	-7	-21	-79	-28	7	-15	-21	28
69	-61	-6	-22	-78	-26	5	-17	-20	27
68	-57	-5	-24	-75	-24	2	-18	-19	26
67	-53	-3	-29	-72	-22	-1	-19	-19	28
66	-49	-1	-34	-68	-20	-6	-19	-19	28
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63	-37	-9	-41	-50	-13	-20	-13	-4	21
62	-34	-14	-38	-44	-12	-24	-10	2	14
61	-30	-17	-33	-39	-12	-27	-9	5	6
60	-25	-17	-29	-36	-12	-29	-11	5	0
59	-22	-16	-26	-35	-13	-29	-13	3	-3
58	-19	-13	-25	-34	-13	-29	-15	0	-4
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51	-7	3	-25	-16	-6	-17	-9	-9	8
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48	-4	2	-21	-6	8	-24	-2	6	-3
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46	-5	-1	-28	-10	4	-25	-5	5	3
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44	-6	-9	-31	-8	-10	-37	-2	-1	-6
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42	-19	-7	-24	-22	-6	-27	-3	1	-3
41	-20	-3	-20	-24	-1	-21	-4	2	-1
40	-22	1	-16	-22	5	-16	0	4	0
39	-22	3	-13	-24	2	-10	-2	-1	3
38	-25	3	-13	-24	1	-12	1	-2	1
37	-29	1	-16	-29	-1	-17	0	-2	-1
36	-32	0	-19	-31	-4	-21	1	-4	-2
35	-32	-1	-19	-33	-2	-24	-1	-1	-5
34	-34	-2	-17	-33	-2	-18	1	0	-1
33	-39	-2	-14	-37	-6	-11	2	-4	3
32	-42	-2	-12	-40	1	-15	2	3	-3
31	-42	0	-13	-40	-1	-9	2	-1	4
30	-43	0	-13	-44	3	-16	-1	3	-3
29	-44	1	-13	-44	1	-17	0	0	-4
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27	-48	1	-12	-46	0	-9	2	-1	3
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23	999	999	999	-52	-1	-5			
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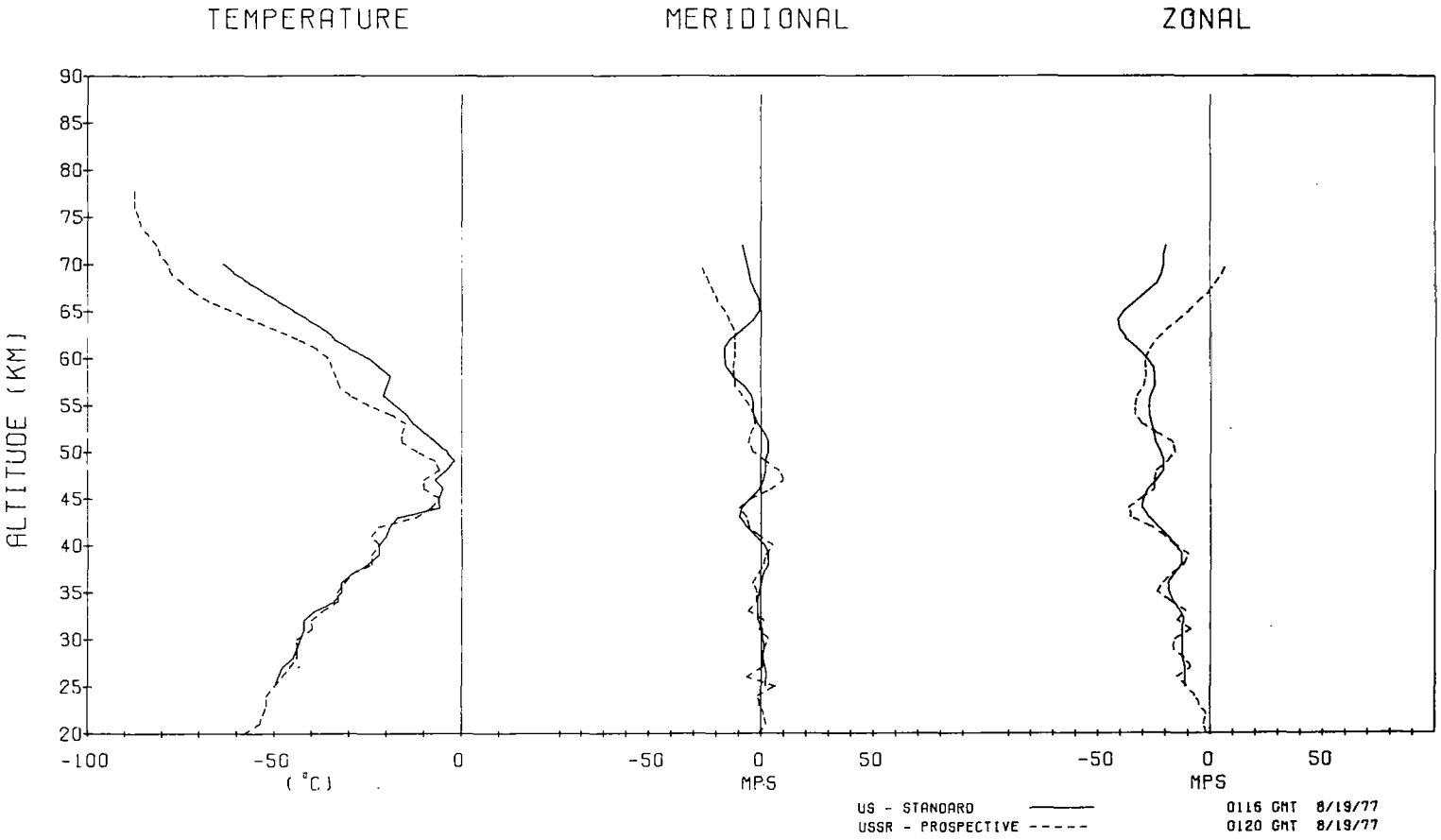
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0116 GMT 8/19/77
0120 GMT 8/19/77

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KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
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67	999	-16	-12	999	-4	-24		12	-12
66	999	-7	-13	999	-11	-23		-4	-10
65	999	-5	-27	999	-16	-23		-11	4
64	999	-9	-44	999	-21	-24		-12	20
63	999	-17	-52	999	-25	-27		-8	25
62	999	-24	-49	999	-27	-29		-3	20
61	999	-25	-41	999	-28	-33		-3	8
60	999	-25	-34	999	-26	-37		-1	-3
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57	999	-17	-26	999	-11	-40		6	-14
56	999	-10	-26	999	-10	-33		0	-7
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54	999	-3	-27	999	-7	-26		-4	1
53	999	-1	-26	999	-6	-25		-5	1
52	999	0	-24	999	-6	-26		-6	-2
51	999	-4	-27	999	-5	-29		-1	-2
50	999	999	999	999	-5	-31			
49	999	999	999	999	-5	-32			
48	999	999	999	999	-5	-30			
47	999	999	999	999	-5	-27			
46	999	999	999	999	-7	-23			
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40	999	999	999	999	-3	-19			
39	999	999	999	999	-1	-17			
38	999	999	999	999	0	-15			
37	999	999	999	999	0	-15			
36	999	999	999	999	-1	-17			
35	999	999	999	999	-1	-19			
34	999	999	999	999	1	-18			
33	999	999	999	999	0	-16			
32	999	999	999	999	0	-14			
31	999	999	999	999	-2	-14			
30	999	999	999	999	0	-11			
29	999	999	999	999	-2	-13			
28	999	999	999	999	4	-9			
27	999	999	999	999	-4	-13			
26	999	999	999	999	-1	-10			
25	999	999	999	999	1	-13			
24	999	999	999	999	-2	-10			
23	999	999	999	999	2	-6			
22	999	999	999	999	4	-3			
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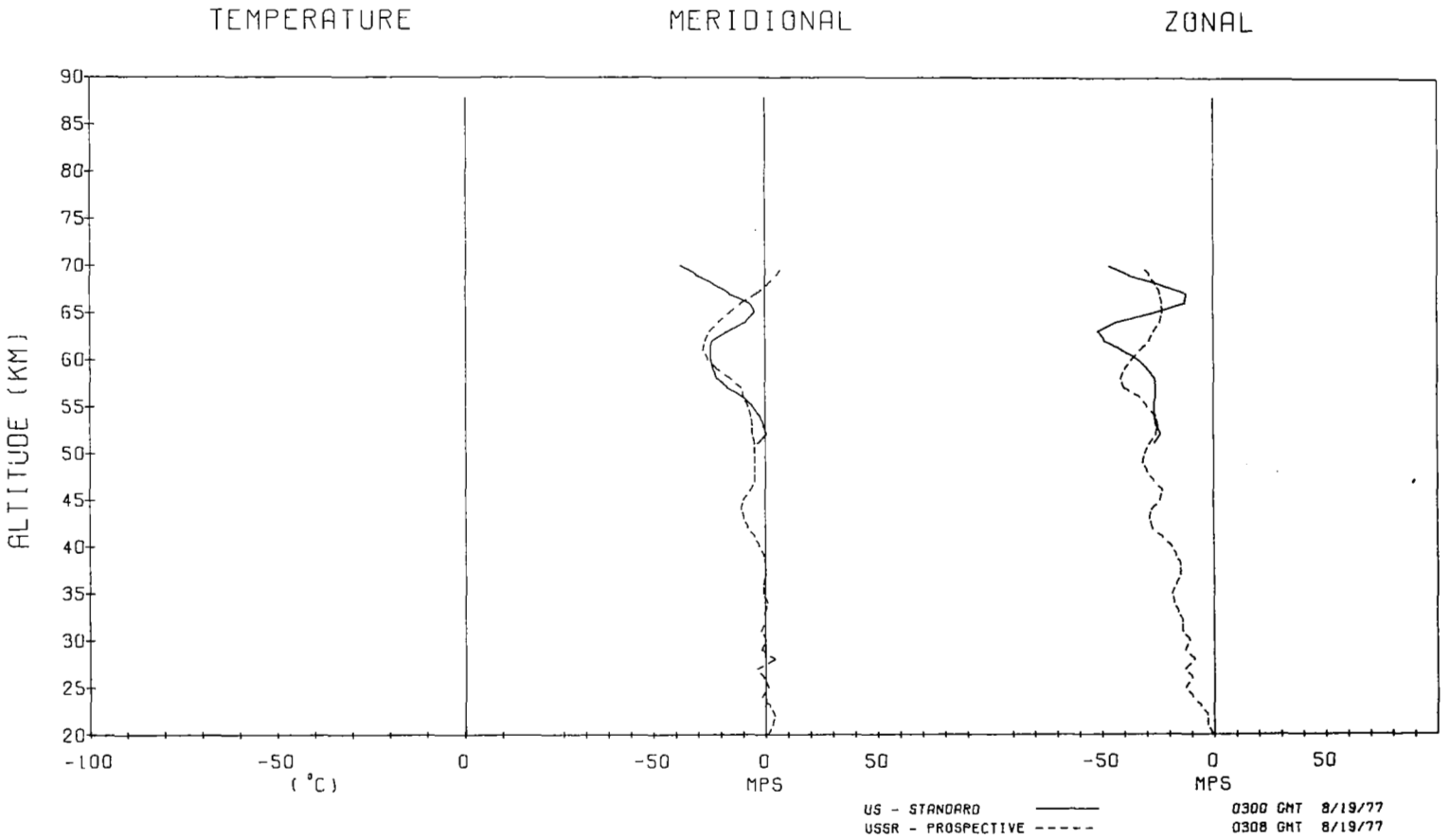
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-100
-50
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(°C)
-50
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MPS
-50
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MPS
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USSR - PROSPECTIVE
0300 GMT 8/19/77
0308 GMT 8/19/77

ALT	US - STANDARD AUG 19 1977 0537 GMT			USSR - PROSPECTIVE AUG 19 1977 0507 GMT			DIFFERENCES USSR-US		
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KM	DEG C	M S		DEG C	M S		DEG C	M S	
		NS	EW		NS	EW		NS	EW
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75	999	999	999	-89	999	999			
74	999	999	999	-82	999	999			
73	999	999	999	-76	999	999			
72	999	999	999	-71	999	999			
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69	-61	-34	-56	-66	999	999	-5		
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67	-53	-38	-36	-67	999	999	-14		
66	-49	-28	-29	-67	999	999	-18		
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63	-43	-7	-61	-58	-27	-35	-15	-20	26
62	-40	-11	-67	-53	-28	-41	-13	-17	26
61	-36	-13	-64	-47	-29	-45	-11	-16	19
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59	-27	-14	-46	-37	-32	-53	-10	-18	-7
58	-25	-19	-40	-32	-33	-54	-7	-14	-14
57	-22	-23	-36	-28	-31	-53	-6	-8	-17
56	-21	-23	-33	-25	-27	-48	-4	-4	-15
55	-19	-19	-32	-24	-19	-39	-5	0	-7
54	-18	-13	-32	-24	-10	-31	-6	3	1
53	-18	-8	-33	-24	-4	-32	-6	4	1
52	-15	-3	-34	-20	1	-33	-5	4	1
51	-11	-1	-35	-15	4	-36	-4	5	-1
50	-10	-1	-35	-11	3	-37	-1	4	-2
49	-7	-3	-34	-9	-1	-36	-2	2	-2
48	-6	-6	-32	-8	-7	-32	-2	-1	0
47	-8	-7	-30	-7	-14	-27	1	-7	3
46	-9	-5	-29	-9	-20	-22	0	-15	7
45	-10	-4	-30	-14	-23	-22	-4	-19	8
44	-10	-5	-30	-18	-17	-27	-8	-12	3
43	-14	-4	-29	-16	-3	-34	-2	1	-5
42	-18	-2	-25	-19	1	-31	-1	3	-6
41	-19	0	-22	-21	-1	-25	-2	-1	-3
40	-21	-1	-20	-26	-4	-20	-5	-3	0
39	-25	-3	-19	-28	-5	-19	-3	-2	0
38	-26	-3	-17	-28	-6	-17	-2	-3	0
37	-28	1	-17	-28	0	-15	0	-1	2
36	-31	5	-18	-29	10	-17	2	5	1
35	-33	5	-20	-30	11	-22	3	6	-2
34	-35	2	-19	-34	-2	-21	1	-4	-2
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32	-36	-2	-14	-41	-8	-12	-5	-6	2
31	-39	-2	-13	-43	-7	-13	-4	-5	0
30	-42	-2	-14	-43	2	-12	-1	4	2
29	-46	0	-14	-46	-1	-20	0	-1	-6
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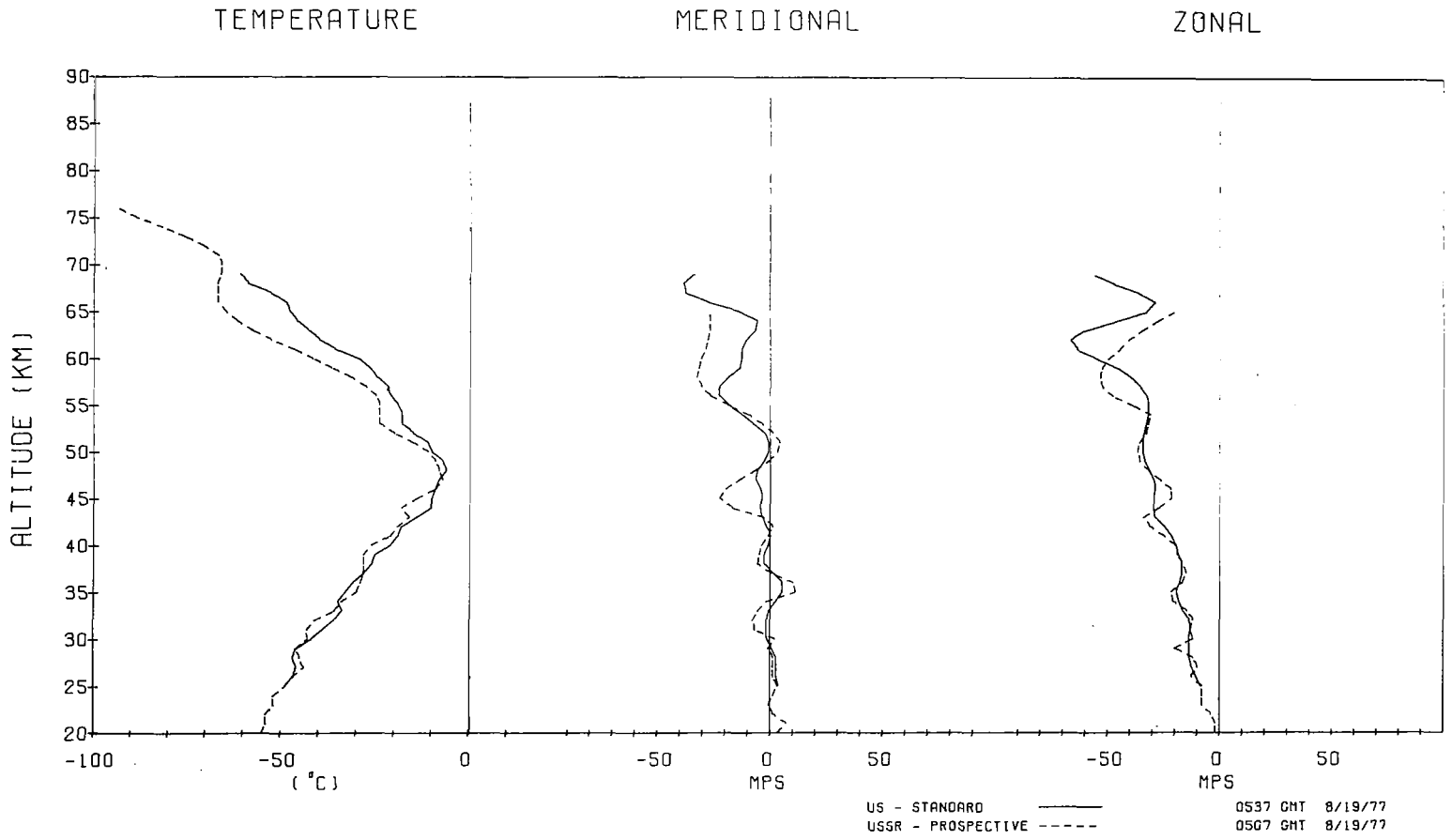
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0537 GMT 8/19/77
0507 GMT 8/19/77

ALT	US - STANDARD AUG 19 1977 2000 GMT			USSR - PROSPECTIVE AUG 19 1977 2005 GMT			DIFFERENCES USSR-US		
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77	999	999	999	-77	999	999			
76	999	999	999	-76	999	999			
75	999	999	999	-73	999	999			
74	999	999	999	-69	999	999			
73	999	999	999	-64	999	999			
72	999	999	999	-58	999	999			
71	999	28	-13	-51	999	999			
70	-54	29	-14	-44	999	999	10		
69	-50	28	-14	-38	999	999	12		
68	-46	26	-16	-34	999	999	12		
67	-40	24	-17	-31	999	999	9		
66	-33	22	-19	-30	999	999	3		
65	-32	19	-21	-30	999	999	2		
64	-35	16	-23	-32	999	999	3		
63	-36	13	-27	-35	999	999	1		
62	-35	11	-30	-37	999	999	-2		
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57	-25	15	-43	-35	7	-31	-10	-8	12
56	-20	18	-45	-29	12	-34	-9	-6	11
55	-16	17	-45	-24	18	-34	-8	1	11
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46	-2	3	-31	-6	7	-31	-4	4	0
45	-4	0	-28	-3	2	-25	1	2	3
44	-10	-1	-25	-6	-1	-18	4	0	7
43	-14	0	-24	-10	-3	-19	4	-3	5
42	-18	3	-22	-15	-4	-23	3	-7	-1
41	-20	7	-21	-21	1	-23	-1	-6	-2
40	-22	9	-22	-20	10	-22	2	1	0
39	-23	6	-22	-24	9	-23	-1	3	-1
38	-25	4	-20	-25	2	-22	0	-2	-2
37	-32	2	-17	-28	2	-19	4	0	-2
36	-31	2	-15	-29	3	-15	2	1	0
35	-31	1	-14	-27	1	-14	4	0	0
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33	-38	0	-11	-31	-1	-11	7	-1	0
32	-39	0	-10	-36	4	-10	3	4	0
31	-39	2	-11	-36	0	-12	3	-2	-1
30	-42	1	-12	-39	2	-14	3	1	-2
29	-46	1	-13	-41	-1	-14	5	-2	-1
28	-44	1	-13	-39	0	-16	5	-1	-3
27	-47	1	-12	-43	-1	-10	4	-2	2
26	-49	1	-10	-44	5	-10	5	4	0
25	-52	2	-8	-47	0	-7	5	-2	1
24	999	999	999	-47	6	-7			
23	999	999	999	-48	2	-5			
22	999	999	999	-47	0	-3			
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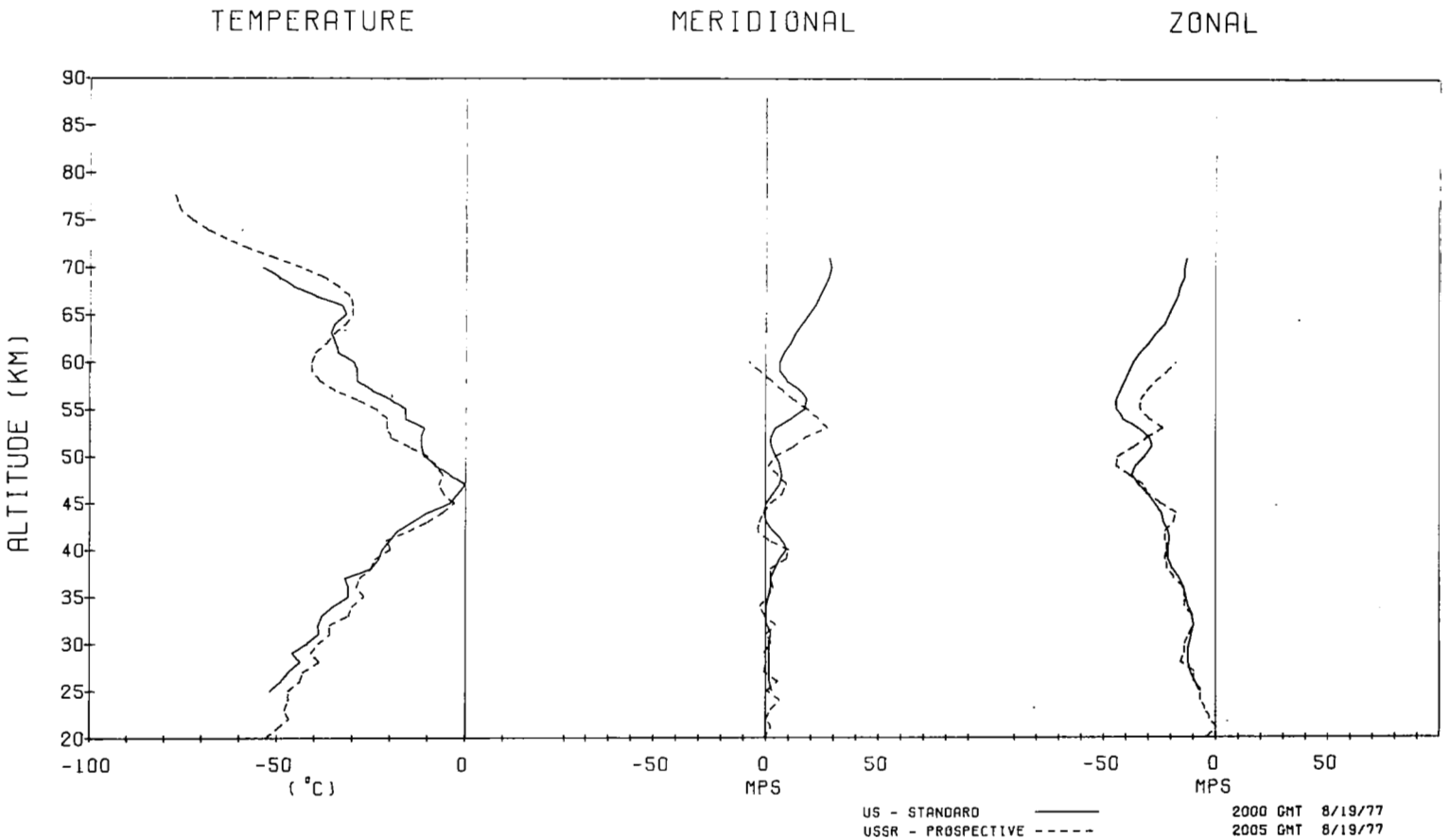
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MERIDIONAL
ZONAL
ALTITUDE (KM)
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(°C)
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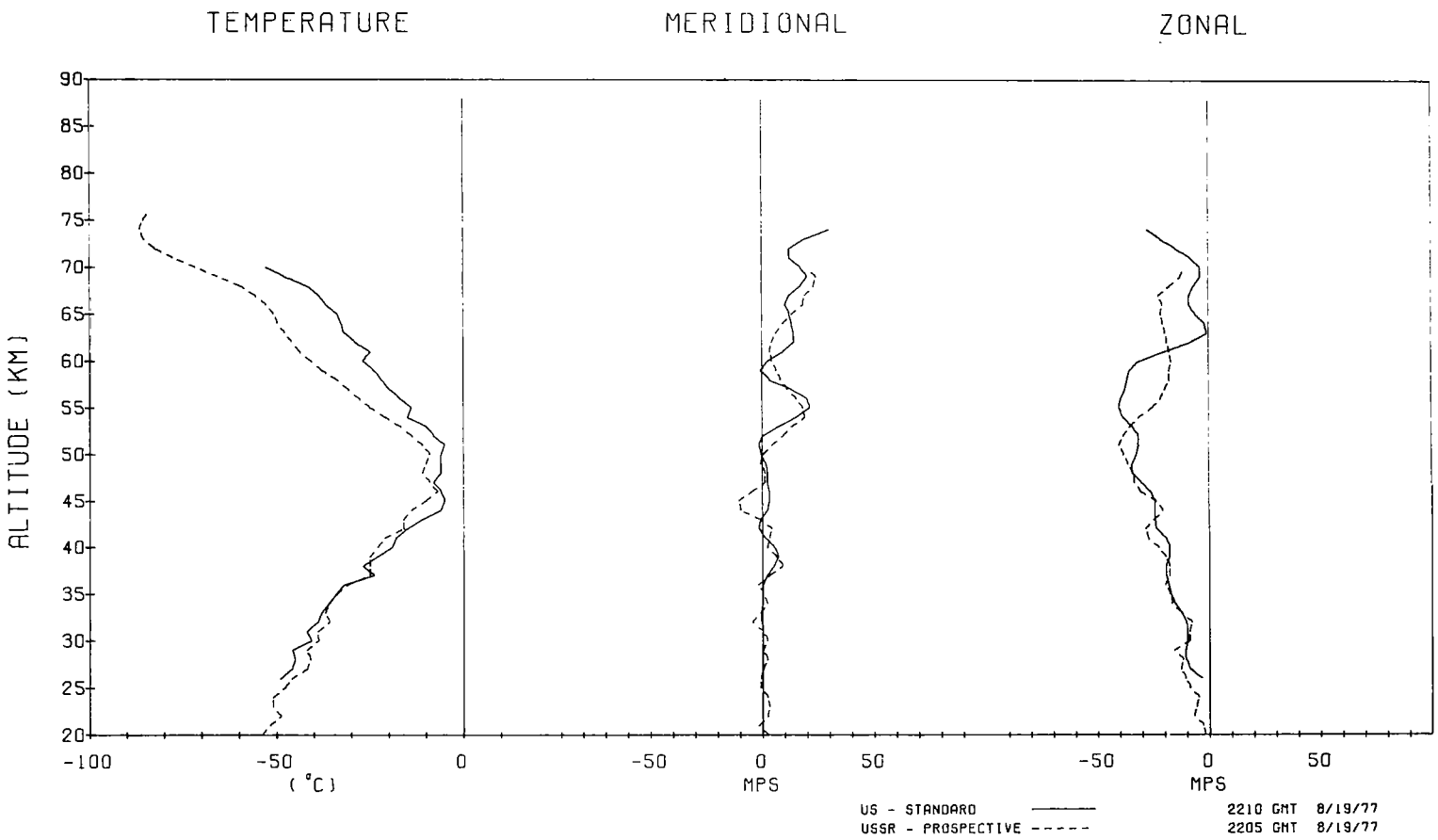
MPS
US - STANDARD
USSR - PROSPECTIVE
2000 GMT 8/19/77
2005 GMT 8/19/77

	US - STANDARD AUG 19 1977 2210 GMT			USSR - PROSPECTIVE AUG 19 1977 2205 GMT			DIFFERENCES USSR-US		
ALT	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
76	999	999	999	-84	999	999			
75	999	999	999	-86	999	999			
74	999	30	-28	-87	999	999			
73	999	19	-22	-86	999	999			
72	999	12	-15	-83	999	999			
71	999	12	-8	-78	999	999			
70	-53	17	-4	-72	20	-11	-19	3	-7
69	-48	20	-4	-66	24	-13	-18	4	-9
68	-42	17	-7	-60	23	-18	-18	6	-11
67	-39	12	-9	-56	19	-23	-17	7	-14
66	-37	10	-9	-53	18	-21	-16	8	-12
65	-34	12	-6	-51	13	-22	-17	1	-16
64	-33	13	-2	-50	9	-21	-17	-4	-19
63	-32	14	-1	-48	6	-20	-16	-8	-19
62	-29	14	-9	-46	4	-19	-17	-10	-10
61	-25	9	-21	-44	3	-18	-19	-6	3
60	-27	2	-32	-41	4	-17	-14	2	15
59	-24	-1	-36	-38	6	-18	-14	7	18
58	-22	3	-37	-34	8	-18	-12	5	19
57	-20	13	-38	-31	11	-20	-11	-2	18
56	-17	20	-40	-28	15	-22	-11	-5	18
55	-14	21	-41	-25	18	-26	-11	-3	15
54	-15	15	-39	-21	19	-32	-6	4	7
53	-10	7	-35	-17	13	-36	-7	6	-1
52	-8	0	-32	-14	9	-39	-6	9	-7
51	-5	-2	-32	-11	4	-41	-6	6	-9
50	-6	-1	-33	-9	0	-39	-3	1	-6
49	-6	1	-35	-10	-1	-37	-4	-2	-2
48	-6	2	-35	-11	1	-35	-5	-1	0
47	-8	2	-31	-9	1	-34	-1	-1	-3
46	-6	3	-27	-7	-5	-31	-1	-8	-4
45	-5	3	-25	-10	-11	-24	-5	-14	1
44	-6	2	-25	-14	-10	-21	-8	-12	4
43	-11	-1	-25	-16	-1	-25	-5	0	0

ALT	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
42	-15	-2	-24	-16	4	-29	-1	6	-5
41	-18	1	-20	-21	3	-28	-3	2	-8
40	-19	5	-18	-23	2	-23	-4	-3	-5
39	-23	7	-18	-25	6	-20	-2	-1	-2
38	-27	5	-20	-25	9	-18	2	4	2
37	-24	2	-20	-25	3	-18	-1	1	2
36	-32	0	-19	-31	-2	-20	1	-2	-1
35	-34	0	-18	-34	0	-18	0	0	0
34	-36	0	-16	-36	2	-17	0	2	-1
33	-38	-1	-13	-37	-1	-13	1	0	0
32	-39	-1	-11	-36	-5	-8	3	-4	3
31	-42	0	-10	-39	0	-9	3	0	1
30	-41	0	-10	-39	2	-9	2	2	1
29	-46	0	-11	-42	0	-16	4	0	-5
28	-45	0	-11	-41	2	-12	4	2	-1
27	-46	0	-9	-42	0	-13	4	0	-4
26	-49	-1	-4	-46	-1	-11	3	0	-7
25	999	999	999	-48	-1	-9			
24	999	999	999	-51	2	-5			
23	999	999	999	-51	3	-6			
22	999	999	999	-49	2	-7			
21	999	999	999	-52	-2	-3			
20	999.	999	999	-54	2	-2			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MPS
US - STANDARD
USSR - PROSPECTIVE
2210 GMT 8/19/77
2205 GMT 8/19/77

ALT	US - STANDARD AUG 20 1977 0100 GMT			USSR - PROSPECTIVE AUG 20 1977 0105 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
77	999	999	999	-83	999	999			
76	999	999	999	-84	999	999			
75	999	999	999	-86	999	999			
74	999	999	999	-87	999	999			
73	999	999	999	-86	999	999			
72	999	999	999	-84	999	999			
71	999	999	999	-80	999	999			
70	999	999	999	-74	999	999			
69	-51	30	8	-67	999	999	-16		
68	-45	26	7	-60	18	-21	-15	-8	-28
67	-42	21	6	-54	16	-18	-12	-5	-24
66	-40	16	2	-49	12	-20	-9	-4	-22
65	-37	9	-3	-46	7	-17	-9	-2	-14
64	-41	0	-11	-44	3	-14	-3	3	-3
63	-38	-7	-21	-42	0	-11	-4	7	10
62	-33	-11	-29	-41	-2	-8	-8	9	21
61	-33	-11	-34	-39	-4	-5	-6	7	29
60	-32	-13	-36	-38	-4	-4	-6	9	32
59	-29	-15	-36	-36	-4	-3	-7	11	33
58	-24	-13	-31	-34	-3	-3	-10	10	28
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56	-19	10	-22	-29	2	-9	-10	-8	13
55	-14	16	-25	-26	5	-16	-12	-11	9
54	-12	13	-30	-21	6	-25	-9	-7	5
53	-12	5	-34	-16	8	-33	-4	3	1
52	-9	-2	-34	-12	8	-39	-3	10	-5
51	-9	-2	-33	-10	8	-41	-1	10	-8
50	-8	2	-32	-8	7	-39	0	5	-7
49	-10	6	-32	-9	6	-36	1	0	-4
48	-9	7	-33	-11	4	-33	-2	-3	0
47	-10	4	-33	-11	2	-30	-1	-2	3
46	-9	1	-31	-11	-1	-28	-2	-2	3
45	-7	-2	-27	-11	-7	-25	-4	-5	2
44	-8	-3	-24	-10	-13	-22	-2	-10	2
43	-11	-4	-24	-12	-12	-22	-1	-8	2
42	-17	-4	-25	-17	-7	-25	0	-3	0
41	-17	-3	-23	-21	-2	-26	-4	1	-3
40	-19	-2	-20	-22	0	-22	-3	2	-2
39	-19	-1	-19	-19	-2	-18	0	-1	1
38	-27	0	-19	-25	-3	-21	2	-3	-2
37	-29	-1	-19	-28	-1	-24	1	0	-5
36	-33	-1	-18	-32	0	-20	1	1	-2
35	-36	0	-17	-33	1	-17	3	1	0
34	-37	1	-16	-37	2	-18	0	1	-2
33	-37	-1	-15	-38	-2	-17	-1	-1	-2
32	-40	-2	-14	-40	-6	-15	0	-4	-1
31	-42	-3	-14	-40	-3	-13	2	0	1
30	-44	-2	-13	-42	-3	-12	2	-1	1
29	-43	-1	-12	-44	-2	-17	-1	-1	-5
28	-47	0	-11	-42	-1	-13	5	-1	-2
27	-46	0	-10	-43	0	-10	3	0	0
26	-48	1	-10	-45	-2	-11	3	-3	-1
25	-50	1	-9	-48	0	-10	2	-1	-1
24	-51	1	-7	-49	-1	-9	2	-2	-2
23	-53	1	-5	-50	0	-6	3	-1	-1
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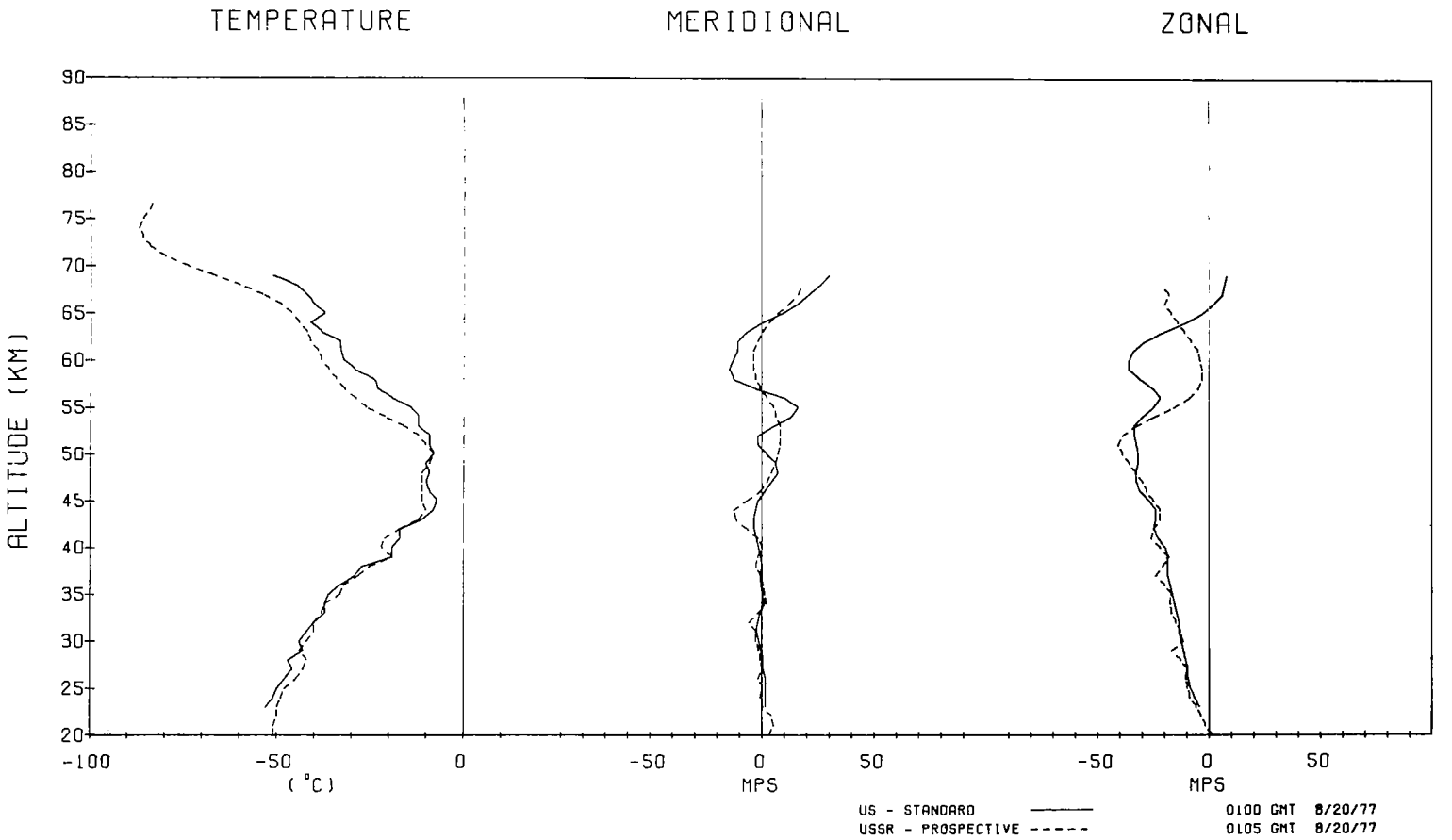
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MPS
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USSR - PROSPECTIVE
0100 GMT 8/20/77
0105 GMT 8/20/77

ALT	US - STANDARD AUG 22 1977 2308 GMT			USSR - PROSPECTIVE AUG 22 1977 2312 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
76	999	999	999	-120	999	999			
75	999	999	999	-113	999	999			
74	999	999	999	-105	999	999			
73	999	999	999	-96	999	999			
72	999	999	999	-88	999	999			
71	999	999	999	-81	999	999			
70	999	999	999	-76	-3	1			
69	-54	12	4	-73	-2	-3	-19	-14	-7
68	-47	5	-1	-71	-3	-7	-24	-8	-6
67	-40	-1	-5	-69	-3	-10	-29	-2	-5
66	-37	-5	-9	-68	-4	-12	-31	1	-3
65	-38	-6	-15	-66	-5	-15	-28	1	0
64	-34	-6	-22	-63	-6	-17	-29	0	5
63	-36	-5	-28	-59	-7	-19	-23	-2	9
62	-35	-2	-29	-53	-7	-20	-18	-5	9
61	-30	3	-31	-47	-7	-19	-17	-10	12
60	-27	7	-35	-40	-7	-17	-13	-14	18
59	-24	6	-37	-34	-7	-14	-10	-13	23
58	-18	0	-33	-28	-6	-10	-10	-6	23
57	-15	-7	-24	-24	-6	-5	-9	1	19
56	-13	-11	-18	-20	-4	-2	-7	7	16
55	-11	-12	-15	-17	-1	-2	-6	11	13
54	-8	-12	-15	-13	-2	-7	-5	10	8
53	-8	-12	-15	-10	-3	-10	-2	9	5
52	-6	-11	-15	-8	-7	-15	-2	4	0
51	-4	-6	-15	-9	-13	-19	-5	-7	-4
50	-5	0	-16	-11	-17	-23	-6	-17	-7
49	-5	5	-18	-13	-15	-27	-8	-20	-9
48	-6	7	-21	-12	-4	-31	-6	-11	-10
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45	-2	1	-29	-10	4	-35	-8	3	-6
44	-8	1	-29	-11	6	-38	-3	5	-9
43	-11	0	-28	-14	4	-35	-3	4	-7
42	-13	-1	-27	-17	1	-31	-4	2	-4
41	-20	-3	-24	-20	-2	-26	0	1	-2
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39	-24	-5	-18	-26	-7	-18	-2	-2	0
38	-25	-4	-17	-25	-5	-17	0	-1	0
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35	-29	-3	-20	-29	-6	-21	0	-3	-1
34	-35	-3	-18	-32	-6	-18	3	-3	0
33	-39	-1	-17	-36	-4	-15	3	-3	2
32	-41	0	-16	-37	1	-20	4	1	-4
31	-39	1	-15	-36	1	-20	3	0	-5
30	-40	1	-13	-42	0	-13	-2	-1	0
29	-43	1	-11	-44	16	9	-1	15	20
28	-45	1	-10	-41	-4	-13	4	-5	-3
27	-45	0	-10	-40	-3	-11	5	-3	-1
26	-47	-1	-9	-45	-3	-8	2	-2	1
25	-51	-1	-9	-49	0	-9	2	1	0
24	-52	-1	-7	-47	-4	-6	5	-3	1
23	999	999	999	-49	-1	-5			
22	999	999	999	-50	1	-4			
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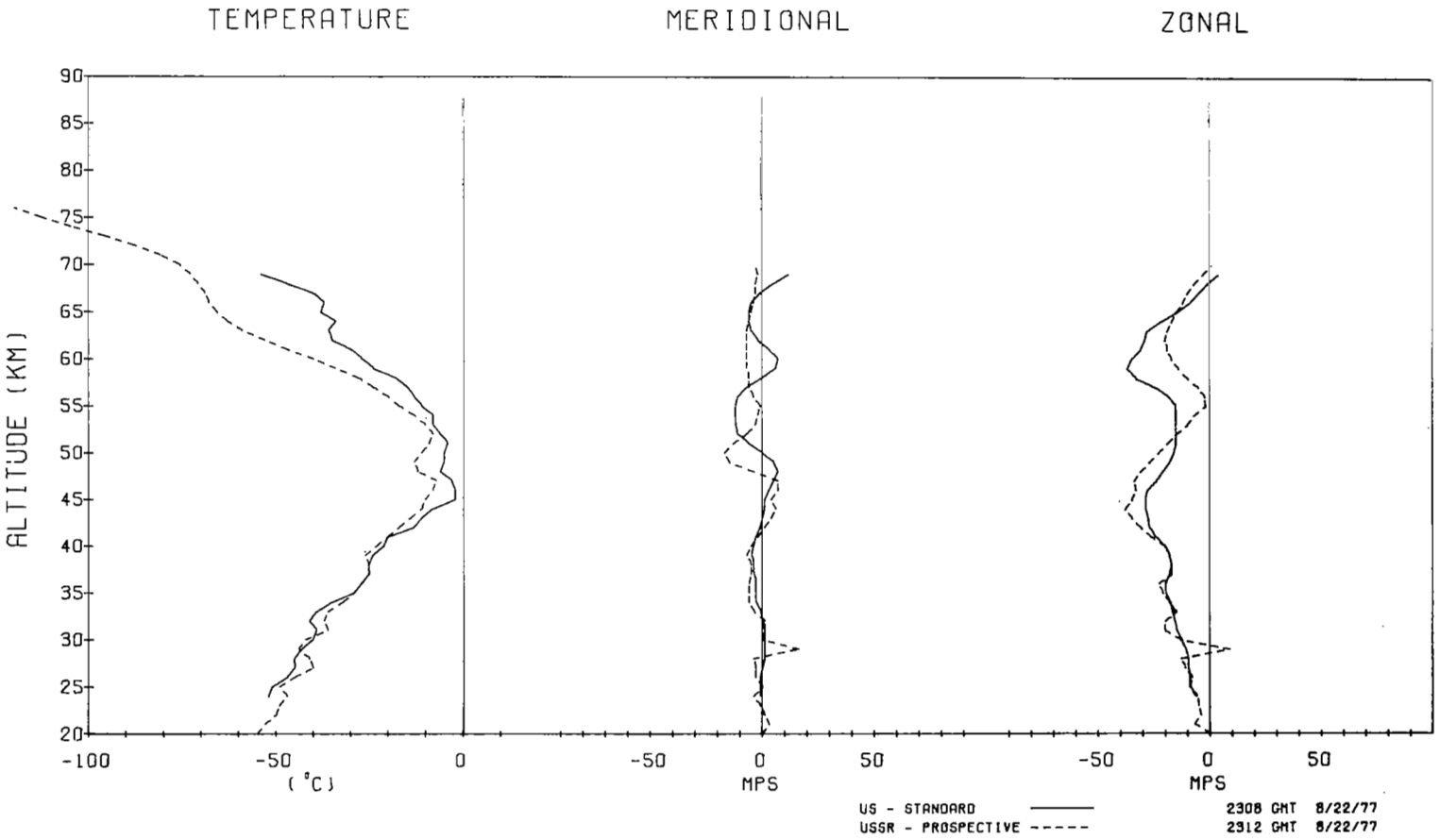
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ZONAL
ALTITUDE (KM)
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-100
-50
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(°C)
-50
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MPS
US - STANDARD
USSR - PROSPECTIVE
2308 GMT 8/22/77
2312 GMT 8/22/77

ALT	US - STANDARD AUG 23 1977 0100 GMT			USSR - PROSPECTIVE AUG 23 1977 0108 GMT			DIFFERENCES USSR-US		
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KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DLG C	M S NS	EW
77	999	999	999	-97	999	999			
76	999	999	999	-94	999	999			
75	999	999	999	-91	999	999			
74	999	999	999	-88	999	999			
73	999	999	999	-86	999	999			
72	999	999	999	-85	999	999			
71	999	999	999	-84	999	999			
70	999	999	999	-83	-26	39			
69	999	999	999	-81	-25	28			
68	-53	-1	17	-77	-26	19	-24	-25	2
67	-46	2	17	-73	-26	11	-27	-28	-6
66	-41	-1	12	-69	-26	4	-28	-25	-8
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64	-40	-15	-16	-61	-25	-8	-21	-10	8
63	-38	-18	-27	-57	-24	-13	-19	-6	14
62	-36	-15	-29	-53	-22	-18	-17	-7	11
61	-36	-7	-29	-50	-21	-22	-14	-14	7
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59	-34	3	-34	-42	-19	-27	-8	-22	7
58	-29	1	-29	-38	-19	-28	-9	-20	1
57	-24	0	-23	-34	-20	-26	-10	-20	-3
56	-21	-1	-18	-30	-21	-23	-9	-20	-5
55	-16	-3	-16	-26	-22	-21	-10	-19	-5
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53	-8	-9	-17	-14	-13	-21	-6	-4	-4
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51	-8	-12	-20	-7	0	-24	1	12	-4
50	-8	-12	-20	-7	5	-25	1	17	-5
49	-10	-10	-21	-9	4	-26	1	14	-5
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47	-8	-6	-22	-12	-5	-26	-4	1	-4
46	-8	-4	-22	-11	-5	-22	-3	-1	0
45	-9	-1	-21	-14	-6	-13	-5	-5	8
44	-12	1	-21	-17	-5	-9	-5	-6	12
43	-11	2	-23	-17	-1	-16	-6	-3	7
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40	-21	-7	-25	-25	-12	-30	-4	-5	-5
39	-25	-8	-22	-30	-13	-25	-5	-5	-3
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36	-32	0	-20	-31	3	-27	1	3	-7
35	-32	0	-21	-32	-4	-23	0	-4	-2
34	-33	-1	-20	-34	-4	-21	-1	-3	-1
33	-36	-1	-17	-35	-2	-13	1	-1	4
32	-38	0	-15	-38	-2	-13	0	-2	2
31	-42	0	-14	-40	-2	-15	2	-2	-1
30	-42	-1	-13	-38	-5	-13	4	-4	0
29	-43	-2	-12	-41	-11	-8	2	-9	4
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27	-46	-1	-11	-45	-5	-15	1	-4	-4
26	-47	0	-10	-45	1	-9	2	1	1
25	-51	0	-10	-51	-5	-14	0	-5	-4
24	-52	-1	-9	-50	-1	-9	2	0	0
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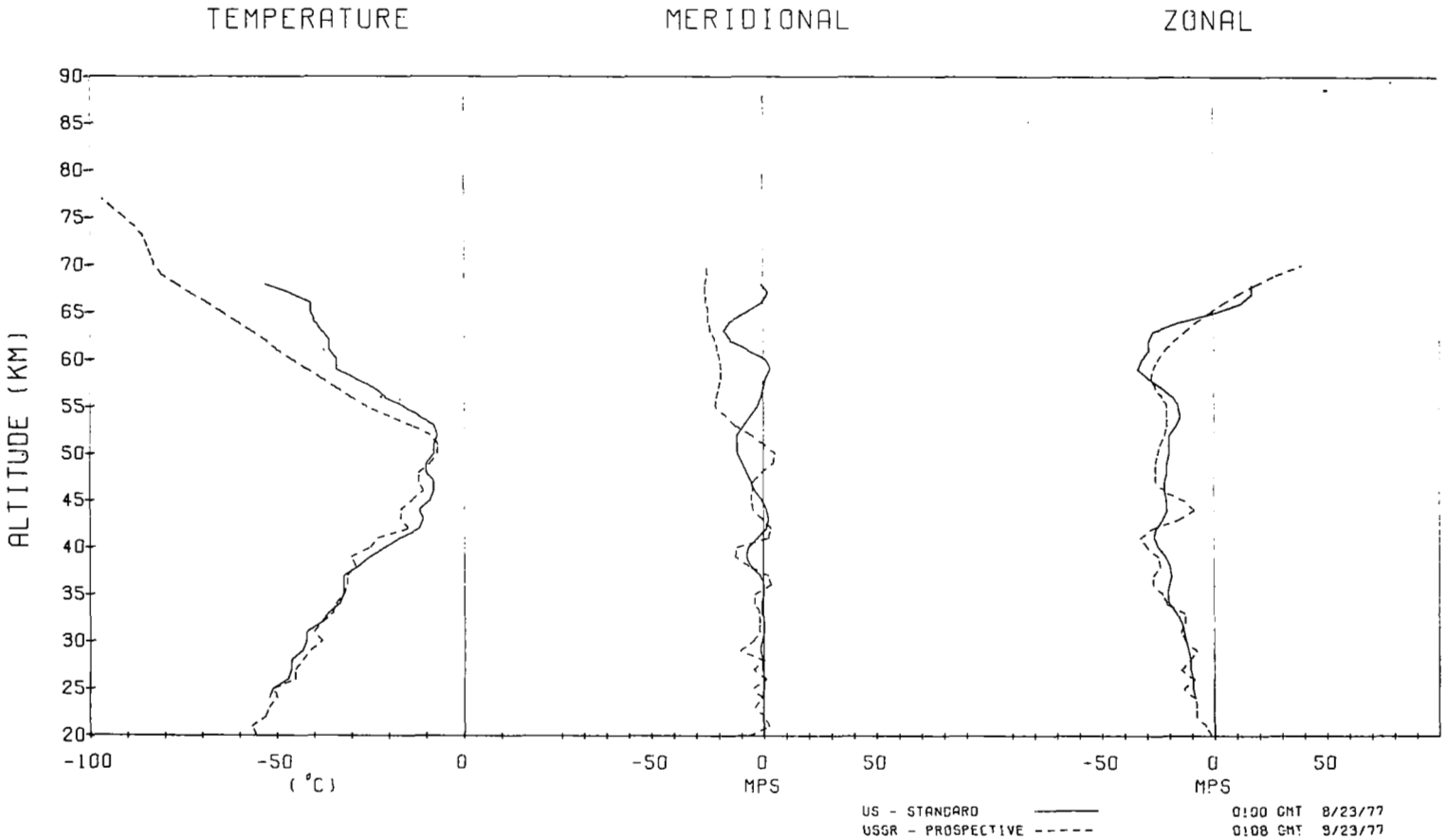
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(°C)
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MPS
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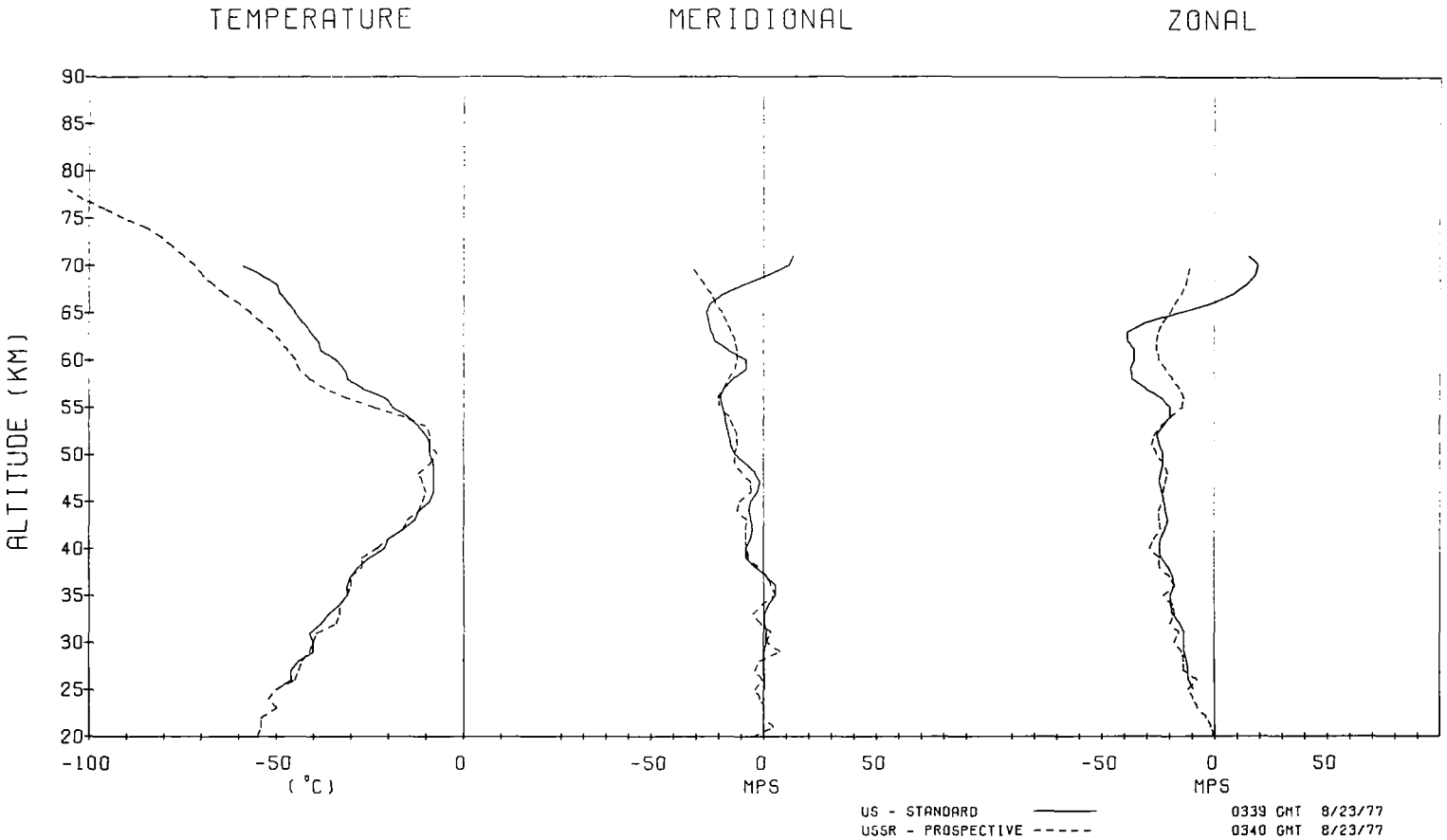
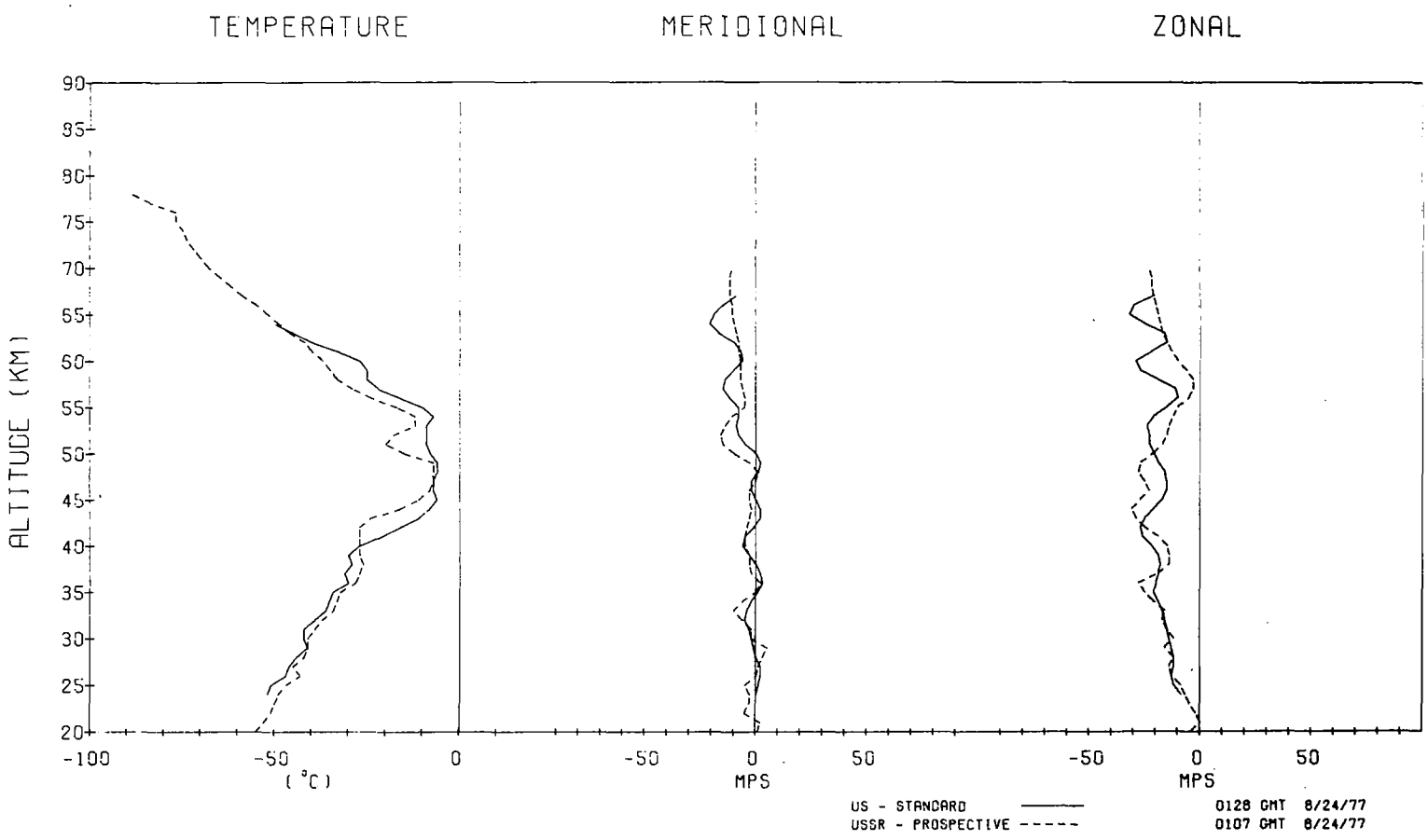
USSR - PROSPECTIVE
0100 GMT 8/23/77
0108 GMT 9/23/77

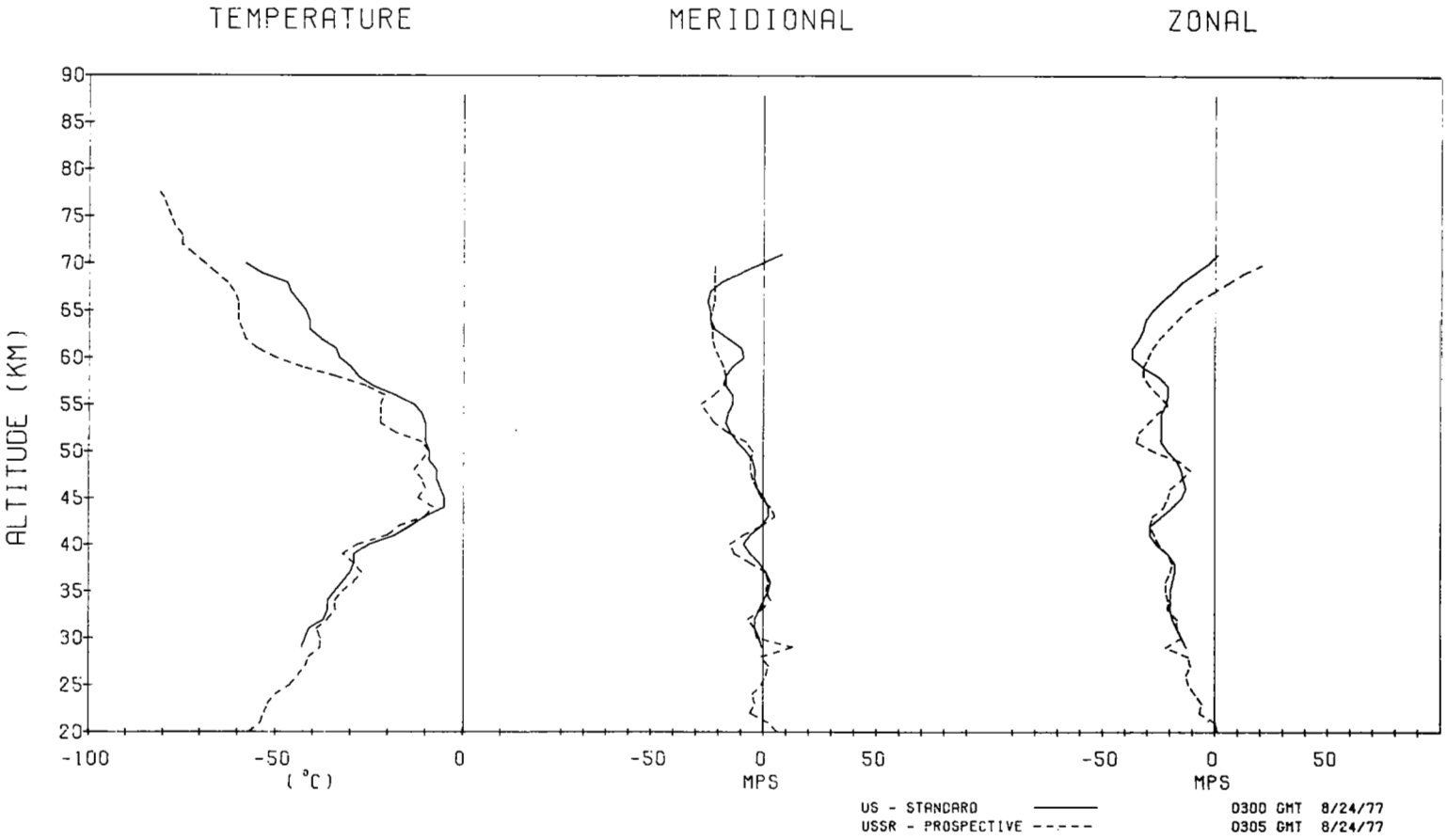
ALT	US - STANDARD AUG 23 1977 0339 GMT			USSR - PROSPECTIVE AUG 23 1977 0340 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
78	999	999	999	-106	999	999			
77	999	999	999	-102	999	999			
76	999	999	999	-96	999	999			
75	999	999	999	-91	999	999			
74	999	999	999	-85	999	999			
73	999	999	999	-81	999	999			
72	999	999	999	-78	999	999			
71	999	13	15	-75	999	999			
70	-59	11	19	-72	-33	-11	-13	-44	-30
69	-54	2	18	-70	-30	-12	-16	-32	-30
68	-50	-9	14	-67	-27	-13	-17	-18	-27
67	-49	-18	8	-64	-24	-15	-15	-6	-23
66	-47	-24	-2	-60	-22	-18	-13	2	-16
65	-45	-26	-17	-57	-19	-20	-12	7	-3
64	-43	-25	-31	-54	-17	-23	-11	8	8
63	-41	-24	-39	-51	-15	-25	-10	9	14
62	-39	-22	-39	-49	-13	-26	-10	9	13
61	-38	-16	-36	-47	-12	-26	-9	4	10
60	-34	-8	-36	-45	-12	-25	-11	-4	11
59	-32	-8	-38	-44	-13	-22	-12	-5	16
58	-31	-14	-37	-41	-16	-19	-10	-2	18
57	-27	-18	-31	-37	-18	-16	-10	0	15
56	-21	-20	-24	-31	-21	-14	-10	-1	10
55	-19	-19	-20	-24	-20	-15	-5	-1	5
54	-15	-18	-20	-16	-16	-20	-1	2	0
53	-12	-17	-23	-10	-14	-24	2	3	-1
52	-10	-16	-26	-9	-12	-27	1	4	-1
51	-9	-15	-25	-9	-12	-28	0	3	-3
50	-9	-13	-23	-7	-13	-26	2	0	-3
49	-8	-8	-23	-9	-13	-23	-1	-5	0
48	-8	-4	-24	-12	-10	-21	-4	-6	3
47	-8	-2	-25	-11	-6	-22	-3	-4	3
46	-8	-3	-24	-10	-6	-23	-2	-3	1
45	-9	-6	-23	-11	-11	-23	-2	-5	0
44	-12	-7	-22	-12	-12	-25	0	-5	-3
43	-13	-6	-21	-15	-8	-25	-2	-2	-4
42	-16	-5	-22	-16	-8	-24	0	-3	-2
41	-20	-6	-24	-20	-8	-27	0	-2	-3
40	-21	-8	-25	-23	-8	-29	-2	0	-4
39	-25	-8	-24	-27	-7	-25	-2	1	-1
38	-28	-4	-21	-27	-3	-25	1	1	-4
37	-30	1	-19	-30	1	-20	0	0	-1
36	-31	5	-18	-30	3	-18	1	-2	0
35	-31	5	-20	-31	5	-23	0	0	-3
34	-33	2	-20	-33	-1	-19	0	-3	1
33	-36	0	-19	-33	-5	-18	3	-5	1
32	-38	0	-16	-34	-2	-20	4	-2	-4
31	-41	1	-14	-39	3	-16	2	2	-2
30	-40	1	-14	-40	1	-18	0	0	-4
29	-40	0	-14	-41	7	-15	-1	7	-1
28	-44	0	-13	-43	-2	-14	1	-2	-1
27	-46	0	-12	-44	-4	-14	2	-4	-2
26	-46	0	-12	-45	-1	-8	1	-1	4
25	-50	0	-10	-50	-4	-12	0	-4	-2
24	999	999	999	-52	-2	-10			
23	999	999	999	-50	0	-8			
22	999	999	999	-54	0	-4			
21	999	999	999	-54	4	-2			
20	999	999	999	-55	-5	-1			


TEMPERATURE
MERIDIONAL
ZONAL
ALTITUDE (KM)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
-100
-50
0
(°C)
-50
0
50
MPS
-50
0
50
MPS
US - STANDARD
USSR - PROSPECTIVE
0339 GMT 8/23/77
0340 GMT 8/23/77

	US - STANDARD AUG 24 1977 0128 GMT			USSR - PROSPECTIVE AUG 24 1977 0107 GMT			DIFFERENCES USSR-US		
ALT	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
78	999	999	999	-89	999	999			
77	999	999	999	-84	999	999			
76	999	999	999	-77	999	999			
75	999	999	999	-77	999	999			
74	999	999	999	-75	999	999			
73	999	999	999	-74	999	999			
72	999	999	999	-72	999	999			
71	999	999	999	-70	999	999			
70	999	999	999	-68	-11	-23			
69	999	999	999	-65	-12	-22			
68	999	999	999	-62	-12	-22			
67	999	-9	-21	-59	-12	-21		-3	0
66	999	-15	-30	-55	-11	-20		4	10
65	999	-19	-32	-52	-11	-19		8	13
64	-50	-21	-25	-49	-10	-18	1	11	7
63	-45	-17	-16	-46	-9	-17	-1	8	-1
62	-40	-10	-15	-42	-8	-15	-2	2	0
61	-33	-7	-22	-40	-8	-13	-7	-1	9
60	-27	-6	-29	-37	-7	-10	-10	-1	19
59	-25	-10	-27	-35	-7	-6	-10	3	21
58	-25	-14	-19	-33	-7	-3	-8	7	16
57	-22	-15	-11	-29	-6	-3	-7	9	8
56	-16	-12	-10	-24	-5	-5	-8	7	5
55	-10	-8	-15	-17	-5	-10	-7	3	5
54	-7	-8	-21	-12	-11	-12	-5	-3	9
53	-9	-9	-24	-12	-14	-14	-3	-5	10
52	-9	-8	-23	-18	-16	-15	-9	-8	8
51	-9	-5	-23	-20	-15	-17	-11	-10	6
50	-8	0	-21	-15	-10	-21	-7	-10	0
49	-6	2	-19	-7	-3	-27	-1	-5	-8
48	-6	1	-16	-7	1	-28	-1	0	-12
47	-7	-2	-15	-7	0	-25	0	2	-10
46	-7	-2	-15	-8	-3	-23	-1	-1	-8
45	-6	0	-17	-11	-3	-27	-5	-3	-10
44	-8	2	-21	-16	-2	-31	-8	-4	-10
43	-11	2	-25	-24	-3	-29	-13	-5	-4
42	-16	-1	-27	-27	-4	-25	-11	-3	2
41	-21	-5	-26	-27	-5	-19	-6	0	7
40	-27	-6	-22	-27	-5	-15	0	1	7
39	-30	-3	-19	-27	-3	-14	3	0	5
38	-29	0	-18	-26	-3	-14	3	-3	4
37	-31	2	-19	-27	-2	-19	4	-4	0
36	-30	3	-20	-28	2	-28	2	-1	-8
35	-34	1	-21	-32	0	-25	2	-1	-4
34	-35	-2	-19	-33	-6	-21	2	-4	-2
33	-36	-4	-17	-34	-10	-16	2	-6	1
32	-39	-5	-16	-37	-6	-17	2	-1	-1
31	-42	-3	-15	-39	-2	-15	3	1	0
30	-42	-2	-14	-41	-2	-12	1	0	2
29	-41	-1	-13	-41	5	-16	0	6	-3
28	-44	0	-12	-42	3	-12	2	3	0
27	-46	2	-12	-45	1	-14	1	-1	-2
26	-47	2	-13	-43	0	-13	4	-2	0
25	-51	1	-12	-47	-5	-9	4	-6	3
24	-52	0	-9	-49	-3	-7	3	-3	2
23	999	999	999	-50	-3	-5			
22	999	999	999	-51	-5	-2			
21	999	999	999	-53	2	0			
20	999	999	999	-55	1	-4			


TEMPERATURE
MERIDIONAL
ZONAL
ALTITUDE (KM)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
-100
-50
0
(°C)
-50
0
50
MPS
-50
0
50
MPS
US - STANDARD
USSR - PROSPECTIVE
0128 GMT 8/24/77
0107 GMT 8/24/77

	US - STANDARD AUG 24 1977 0300 GMT			USSR - PROSPECTIVE AUG 24 1977 0305 GMT			DIFFERENCES USSR-US		
ALT	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
78	999	999	999	-82	999	999			
77	999	999	999	-80	999	999			
76	999	999	999	-79	999	999			
75	999	999	999	-78	999	999			
74	999	999	999	-77	999	999			
73	999	999	999	-75	999	999			
72	999	999	999	-75	999	999			
71	999	8	1	-72	999	999			
70	-58	-1	-3	-69	-22	22	-11	-21	25
69	-54	-10	-9	-66	-22	13	-12	-12	22
68	-47	-19	-15	-63	-22	6	-16	-3	21
67	-46	-24	-19	-61	-22	-1	-15	2	18
66	-44	-25	-24	-60	-22	-8	-16	3	16
65	-42	-24	-28	-60	-23	-13	-18	1	15
64	-41	-24	-31	-60	-24	-17	-19	0	14
63	-41	-22	-32	-59	-23	-21	-18	-1	11
62	-38	-16	-34	-58	-23	-25	-20	-7	9
61	-34	-10	-37	-55	-22	-28	-21	-12	9
60	-33	-9	-37	-50	-20	-30	-17	-11	7
59	-30	-14	-32	-43	-18	-32	-13	-4	0
58	-28	-17	-25	-34	-17	-32	-6	0	-7
57	-24	-17	-21	-26	-18	-29	-2	-1	-8
56	-18	-14	-21	-21	-22	-25	-3	-8	-4
55	-13	-14	-22	-22	-28	-21	-9	-14	1
54	-11	-16	-24	-22	-25	-26	-11	-9	-2
53	-10	-17	-24	-22	-22	-30	-12	-5	-6
52	-10	-15	-24	-18	-16	-34	-8	-1	-10
51	-10	-12	-24	-11	-8	-35	-1	4	-11
50	-9	-8	-21	-9	-5	-27	0	3	-6
49	-9	-5	-17	-11	-6	-16	-2	-1	1
48	-7	-4	-15	-13	-6	-11	-6	-2	4
47	-7	-4	-14	-11	-5	-15	-4	-1	-1
46	-6	-3	-13	-10	-3	-20	-4	0	-7
45	-5	0	-15	-12	-1	-21	-7	-1	-6
44	-5	2	-19	-8	3	-23	-3	1	-4
43	-10	2	-24	-10	5	-28	0	3	-4
42	-14	-1	-29	-17	-1	-29	-3	0	0
41	-18	-6	-29	-20	-9	-27	-2	-3	2
40	-25	-9	-26	-28	-15	-25	-3	-6	1
39	-29	-6	-21	-32	-13	-21	-3	-7	0
38	-29	-2	-18	-29	-6	-19	0	-4	-1
37	-30	1	-18	-27	1	-20	3	0	-2
36	-32	3	-19	-29	2	-22	3	-1	-3
35	-34	2	-20	-32	1	-22	2	-1	-2
34	-36	0	-20	-34	3	-21	2	3	-1
33	-36	-2	-20	-34	-1	-21	2	1	-1
32	-37	-4	-19	-36	-7	-17	1	-3	2
31	-41	-4	-17	-39	-4	-17	2	0	0
30	-42	-2	-15	-38	-3	-15	4	-1	0
29	-43	-1	-13	-38	13	-22	5	14	-9
28	999	999	999	-41	-1	-12			
27	999	999	999	-42	2	-11			
26	999	999	999	-44	1	-13			
25	999	999	999	-46	-1	-12			
24	999	999	999	-50	-5	-9			
23	999	999	999	-52	-4	-6			
22	999	999	999	-53	-6	-7			
21	999	999	999	-54	2	0			
20	999	999	999	-57	6	1			
19	999	999	999	-57	-1	2			
18	999	999	999	-60	-2	8			

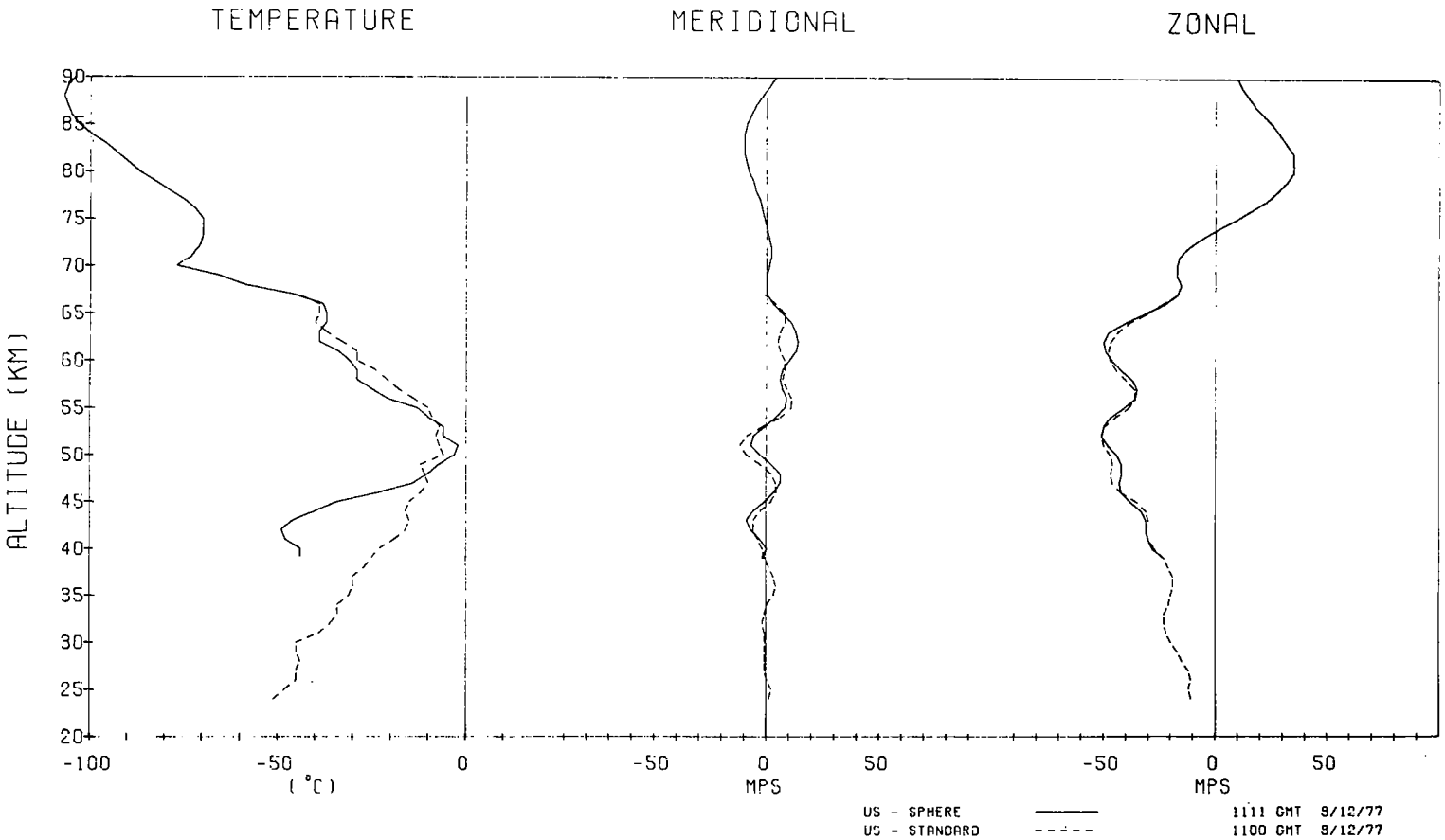

TEMPERATURE
MERIDIONAL
ZONAL
ALTITUDE (KM)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
-100
-50
0
(°C)
-50
0
50
MPS
-50
0
50
MPS
US - STANDARD
USSR - PROSPECTIVE
0300 GMT 8/24/77
0305 GMT 8/24/77

APPENDIX C

LISTINGS AND PLOTS OF US(STANDARD) AND US(SPHERE) DATA

A comparison of data obtained from the US Super-Loki Datasonde and Super-Loki Sphere rocketsonde systems using standard data reduction techniques are presented with corresponding differences listed.

	US - SPHERE AUG 12 1977 1111 GMT			US - STANDARD AUG 12 1977 1100 GMT			DIFFERENCES STD-SPHERE		
ALT	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
93	-90	13	2	999	999	999			
92	-95	10	5	999	999	999			
91	-100	8	8	999	999	999			
90	-104	4	10	999	999	999			
89	-106	1	12	999	999	999			
88	-107	-2	15	999	999	999			
87	-106	-5	18	999	999	999			
86	-105	-7	22	999	999	999			
85	-103	-9	26	999	999	999			
84	-100	-10	29	999	999	999			
83	-96	-10	32	999	999	999			
82	-93	-10	35	999	999	999			
81	-90	-9	35	999	999	999			
80	-87	-8	35	999	999	999			
79	-83	-6	32	999	999	999			
78	-79	-5	28	999	999	999			
77	-75	-3	23	999	999	999			
76	-72	-2	16	999	999	999			
75	-70	-1	9	999	999	999			
74	-70	0	1	999	999	999			
73	-70	1	-6	999	999	999			
72	-71	2	-12	999	999	999			
71	-73	2	-16	999	999	999			
70	-77	1	-17	999	999	999			
69	-66	0	-17	999	999	999			
68	-59	0	-15	999	999	999			
67	-46	0	-17	-45	-1	-17	1	-1	0
66	-38	3	-23	-39	4	-24	-1	1	-1
65	-37	7	-32	-39	8	-31	-2	1	1
64	-37	11	-41	-40	8	-39	-3	-3	2
63	-39	13	-48	-37	6	-44	2	-7	4
62	-39	14	-50	-33	5	-47	6	-9	3
61	-34	13	-49	-29	6	-48	5	-7	1
60	-31	10	-46	-29	8	-47	2	-2	-1
59	-29	7	-42	-24	8	-44	5	1	-2
58	-29	6	-37	-21	7	-40	8	1	-3
57	-25	7	-35	-18	9	-36	7	2	-1
56	-21	9	-36	-14	11	-36	7	2	0
55	-13	8	-41	-10	11	-39	3	3	2
54	-10	4	-47	-9	6	-45	1	2	2
53	-6	-1	-50	-7	-2	-50	-1	-1	0
52	-6	-6	-51	-8	-9	-51	-2	-3	0
51	-2	-7	-48	-7	-12	-50	-5	-5	-2
50	-3	-3	-44	-6	-9	-47	-3	-6	-3
49	-7	2	-42	-12	-3	-46	-5	-5	-4
48	-10	6	-42	-11	2	-47	-1	-4	-5
47	-14	6	-43	-10	4	-46	4	-2	-3
46	-23	3	-42	-12	4	-42	11	1	0
45	-34	-1	-38	-15	2	-35	19	3	3
44	-40	-6	-33	-16	-3	-31	24	3	2
43	-46	-9	-31	-15	-6	-30	31	3	1
42	-49	-7	-31	-16	-6	-31	33	1	0
41	-48	-3	-30	-19	-4	-30	29	-1	0
40	-44	0	-28	-23	-2	-27	21	-2	1
39	-44	-2	-23	-25	-1	-23	19	1	0
38	999	999	999	-27	1	-21			
37	999	999	999	-30	3	-19			
36	999	999	999	-30	4	-19			
35	999	999	999	-31	3	-20			
34	999	999	999	-34	0	-21			
33	999	999	999	-34	-1	-23			
32	999	999	999	-36	-2	-23			
31	999	999	999	-39	-1	-22			
30	999	999	999	-45	-1	-20			
29	999	999	999	-45	-1	-17			
28	999	999	999	-44	-1	-15			
27	999	999	999	-45	-1	-12			
26	999	999	999	-45	0	-11			


TEMPERATURE
MERIDIONAL
ZONAL
ALTITUDE (KM)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
-100
-50
0
(°C)
-50
0
50
MPS
-50
0
50
MPS
US - SPHERE
US - STANDARD
1111 GMT 8/12/77
1100 GMT 8/12/77

ALT	US - SPHERE AUG 15 1977 1942 GMT			US - STANDARD AUG 15 1977 1930 GMT			DIFFERENCES STD-SPHERE		
	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
94	-81	-5	65	999	999	999			
93	-76	13	64	999	999	999			
92	-68	31	59	999	999	999			
91	-62	46	49	999	999	999			
90	-56	58	36	999	999	999			
89	-51	63	21	999	999	999			
88	-52	64	7	999	999	999			
87	-55	60	-6	999	999	999			
86	-60	53	-15	999	999	999			
85	-66	44	-21	999	999	999			
84	-73	35	-23	999	999	999			
83	-79	25	-22	999	999	999			
82	-83	17	-20	999	999	999			
81	-85	11	-16	999	999	999			
80	-87	6	-11	999	999	999			
79	-86	3	-5	999	999	999			
78	-83	2	-1	999	999	999			
77	-81	4	2	999	999	999			
76	-79	7	4	999	999	999			
75	-77	11	2	999	999	999			
74	-76	16	-2	999	999	999			
73	-75	20	-9	999	28	-13		8	-4
72	-73	21	-19	999	28	-27		7	-8
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70	-65	13	-39	-61	7	-49	4	-6	-10
69	-62	7	-45	-58	-2	-50	4	-9	-5
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67	-49	5	-44	-45	3	-44	4	-2	0
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65	-44	6	-37	-39	0	-40	5	-6	-3
64	-41	4	-36	-39	0	-36	2	-4	0
63	-40	3	-36	-34	5	-35	6	2	1
62	-37	4	-38	-31	11	-38	6	7	0
61	-36	5	-40	-31	12	-42	5	7	-2
60	-33	0	-39	-26	5	-43	7	5	-4
59	-28	-6	-37	-23	-4	-40	5	2	-3
58	-26	-9	-33	-21	-9	-36	5	0	-3
57	-22	-5	-30	-17	-5	-32	5	0	-2
56	-17	4	-30	-14	5	-33	3	1	-3
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54	-15	13	-37	-11	15	-37	4	2	0
53	-11	12	-39	-8	14	-38	3	2	1
52	-14	12	-38	-5	13	-38	9	1	0
51	-8	13	-34	-3	13	-37	5	0	-3
50	-4	15	-33	-4	13	-35	0	-2	-2
49	-1	15	-34	-2	13	-36	-1	-2	-2
48	3	14	-36	-5	13	-38	-8	-1	-2
47	6	12	-38	-4	10	-39	-10	-2	-1
46	4	7	-38	-4	5	-38	-8	-2	0
45	3	1	-36	-4	0	-36	-7	-1	0
44	0	-3	-32	-5	-3	-32	-5	0	0
43	-9	-2	-27	-12	-1	-26	-3	1	1
42	-17	2	-22	-21	3	-22	-4	1	0
41	-20	5	-17	-22	7	-18	-2	2	-1
40	-25	7	-16	-22	9	-17	3	2	-1
39	-24	5	-17	-23	7	-18	1	2	-1
38	-20	4	-18	-25	5	-19	-5	1	-1
37	-22	2	-18	-26	3	-19	-4	1	-1
36	-32	0	-17	-28	0	-18	4	0	-1
35	-34	-1	-15	-31	-1	-16	3	0	-1
34	-44	1	-14	-35	1	-14	9	0	0
33	-33	4	-14	-36	4	-13	-3	0	1
32	-21	5	-15	-38	5	-14	-17	0	1
31	-22	2	-16	-39	4	-15	-17	2	1
30	-33	1	-17	-42	2	-16	-9	1	1
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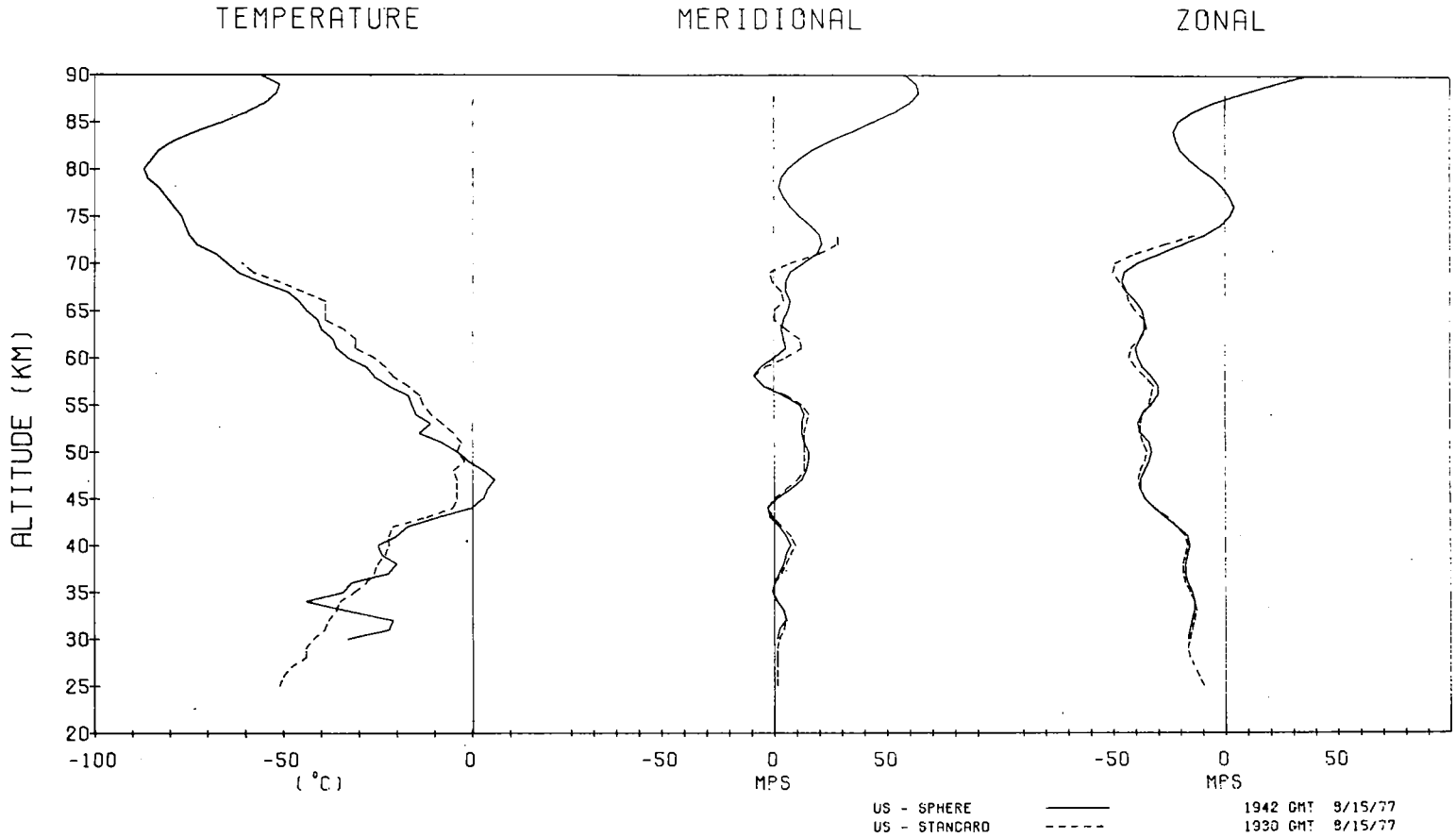
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(°C)
-50
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MPS
-50
0
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MPS
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1942 GMT 9/15/77
1930 GMT 9/15/77

ALT	US - SPHERE AUG 16 1977 0123 GMT			US - STANDARD AUG 16 1977 0113 GMT			DIFFERENCES STD-SPHERE		
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KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
93	-87	-71	51	999	999	999			
92	-85	-65	63	999	999	999			
91	-82	-57	74	999	999	999			
90	-78	-47	81	999	999	999			
89	-74	-35	85	999	999	999			
88	-72	-22	84	999	999	999			
87	-72	-11	79	999	999	999			
86	-72	0	72	999	999	999			
85	-73	8	64	999	999	999			
84	-76	12	55	999	999	999			
83	-80	14	46	999	999	999			
82	-82	14	38	999	999	999			
81	-84	11	31	999	999	999			
80	-86	7	25	999	999	999			
79	-85	1	20	999	999	999			
78	-83	-5	16	999	999	999			
77	-80	-11	13	999	999	999			
76	-78	-16	11	999	999	999			
75	-77	-19	10	999	999	999			
74	-75	-19	8	999	999	999			
73	-74	-17	6	999	999	999			
72	-72	-12	1	999	-18	9		-6	8
71	-69	-5	-5	999	-1	-2		4	3
70	-68	0	-13	-47	11	-13	21	11	0
69	-62	0	-22	-41	12	-25	21	12	-3
68	-58	-5	-31	-39	3	-35	19	8	-4
67	-55	-11	-36	-48	-7	-41	7	4	-5
66	-51	-15	-37	-52	-11	-41	-1	4	-4
65	-50	-15	-34	-52	-10	-33	-2	5	1
64	-46	-13	-27	-48	-8	-24	-2	5	3
63	-36	-11	-21	-44	-7	-18	-8	4	3
62	-31	-9	-20	-38	-5	-18	-7	4	2
61	-28	-7	-25	-34	-2	-24	-6	5	1
60	-23	-5	-33	-30	-1	-33	-7	4	0
59	-19	-4	-38	-25	-2	-39	-6	2	-1
58	-18	-3	-40	-22	-2	-40	-4	1	0
57	-17	1	-38	-18	1	-38	-1	0	0
56	-12	8	-36	-14	5	-36	-2	-3	0
55	-5	15	-35	-9	9	-36	-4	-6	-1
54	2	15	-35	-6	9	-36	-8	-6	-1
53	2	8	-35	-3	4	-36	-5	-4	-1
52	8	-4	-36	-1	-5	-36	-9	-1	0
51	8	-13	-37	-3	-10	-34	-11	3	3
50	2	-17	-36	-4	-12	-33	-6	5	3
49	-2	-15	-34	-5	-10	-31	-3	5	3
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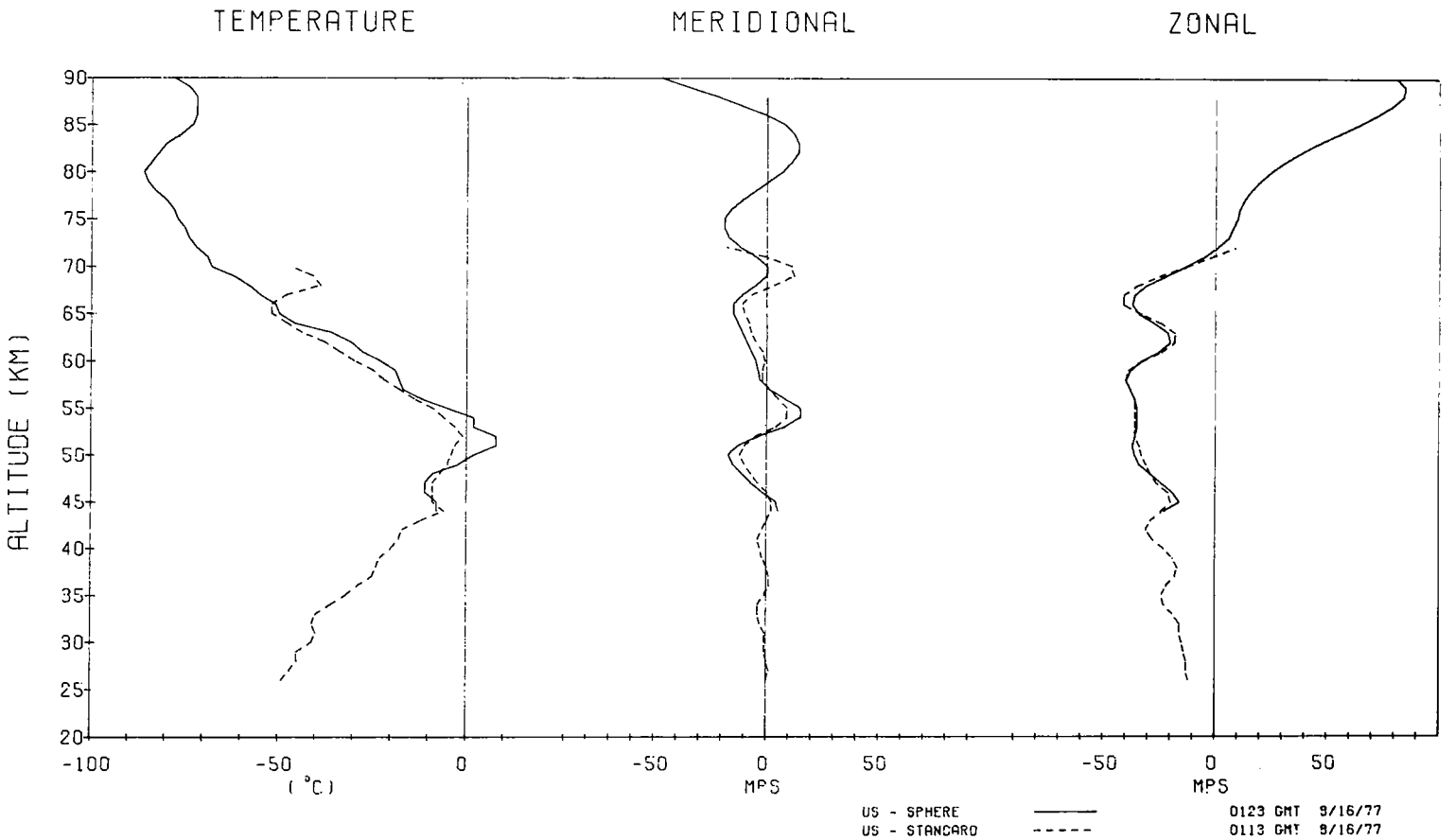
47	-11	-7	-24	-9	-4	-26	2	3	-2
46	-11	-2	-19	-9	0	-21	2	2	-2
45	-8	4	-16	-9	2	-20	-1	-2	-4
44	-8	5	-23	-6	2	-24	2	-3	-1
43	999	999	999	-12	0	-29			
42	999	999	999	-17	-2	-31			
41	999	999	999	-18	-4	-28			
40	999	999	999	-20	-3	-23			
39	999	999	999	-23	-2	-19			
38	999	999	999	-24	0	-17			
37	999	999	999	-25	1	-18			
36	999	999	999	-29	1	-22			
35	999	999	999	-32	-1	-24			
34	999	999	999	-36	-4	-23			
33	999	999	999	-40	-4	-19			
32	999	999	999	-41	-3	-16			
31	999	999	999	-40	-1	-16			
30	999	999	999	-41	-1	-15			
29	999	999	999	-45	-1	-14			
28	999	999	999	-45	0	-13			
27	999	999	999	-47	1	-13			
26	999	999	999	-49	0	-12			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ZONAL
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(°C)
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50
MPS
US - SPHERE
US - STANDARD
0123 GMT 9/16/77
0113 GMT 9/16/77

ALT	US - SPHERE AUG 16 1977 2032 GMT			US - STANDARD AUG 16 1977 2000 GMT			DIFFERENCES STD-SPHERE		
	TEMP	COMPONENT WINDS $M\ S^{-1}$		TEMP	COMPONENT WINDS $M\ S^{-1}$		TEMP	COMPONENT WINDS $M\ S^{-1}$	
KM	DEG C	NS	EW	DEG C	NS	EW	DEG C	NS	EW
94	-86	9	-22	999	999	999			
93	-83	8	-18	999	999	999			
92	-81	7	-13	999	999	999			
91	-81	7	-6	999	999	999			
90	-85	8	2	999	999	999			
89	-88	9	9	999	999	999			
88	-91	11	15	999	999	999			
87	-94	15	19	999	999	999			
86	-96	18	22	999	999	999			
85	-96	20	23	999	999	999			
84	-93	21	22	999	999	999			
83	-90	20	20	999	999	999			
82	-86	18	16	999	999	999			
81	-81	14	12	999	999	999			
80	-78	10	8	999	999	999			
79	-75	5	4	999	999	999			
78	-72	0	0	999	999	999			
77	-71	-4	-4	999	999	999			
76	-71	-8	-7	999	999	999			
75	-72	-10	-10	999	999	999			
74	-72	-10	-13	999	999	999			
73	-70	-8	-15	999	999	999			
72	-67	-2	-18	999	-17	-15		-15	3
71	-64	7	-21	999	-8	-27		-15	-6
70	-65	17	-27	-58	-2	-39	7	-19	-12
69	-59	23	-33	-55	-2	-47	4	-25	-14
68	-55	22	-38	-49	-7	-47	6	-29	-9
67	-48	12	-40	-45	-11	-42	3	-23	-2
66	-41	-3	-39	-42	-13	-36	-1	-10	3
65	-39	-17	-35	-37	-17	-31	2	0	4
64	-42	-27	-30	-36	-23	-26	6	4	4
63	-46	-29	-26	-33	-24	-22	13	5	4
62	-48	-23	-24	-32	-14	-20	16	9	4
61	-44	-11	-25	-31	1	-21	13	12	4
60	-38	3	-31	-28	15	-26	10	12	5
59	-33	13	-38	-23	20	-33	10	7	5
58	-32	14	-42	-21	18	-41	11	4	1
57	-22	11	-43	-16	13	-44	6	2	-1
56	-15	8	-40	-14	9	-45	1	1	-5
55	-9	7	-37	-11	6	-43	-2	-1	-6
54	-3	5	-35	-9	4	-42	-6	-1	-7
53	3	3	-33	-6	1	-40	-9	-2	-7
52	1	0	-32	-5	-3	-38	-6	-3	-6
51	-1	-2	-31	-3	-5	-35	-2	-3	-4
50	-3	-1	-31	-5	-4	-32	-2	-3	-1
49	-4	1	-31	-4	-1	-30	0	-2	1
48	-6	3	-31	-3	1	-28	3	-2	3
47	-3	3	-31	-2	4	-28	1	1	3
46	-6	4	-31	-4	6	-29	2	2	2
45	-8	5	-32	-7	6	-32	1	1	0
44	-5	5	-32	-8	5	-34	-3	0	-2
43	0	5	-30	-9	3	-33	-9	-2	-3
42	-3	4	-26	-14	3	-28	-11	-1	-2
41	-8	4	-21	-17	4	-22	-9	0	-1
40	-15	3	-18	-17	5	-18	-2	2	0
39	-26	4	-18	-18	6	-17	8	2	1
38	-36	4	-20	-21	5	-20	15	1	0
37	-39	2	-21	-24	2	-21	15	0	0
36	-30	-2	-19	-27	-1	-20	3	1	-1
35	-26	-4	-15	-30	-3	-16	-4	1	-1
34	-23	-4	-14	-32	-2	-14	-9	2	0
33	-33	-2	-13	-34	1	-14	-1	3	-1
32	-34	3	-14	-36	3	-16	-2	0	-2
31	-40	8	-16	-38	4	-17	2	-4	-1
30	-53	7	-17	-40	3	-17	13	-4	0
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28	999	999	999	-44	1	-16			
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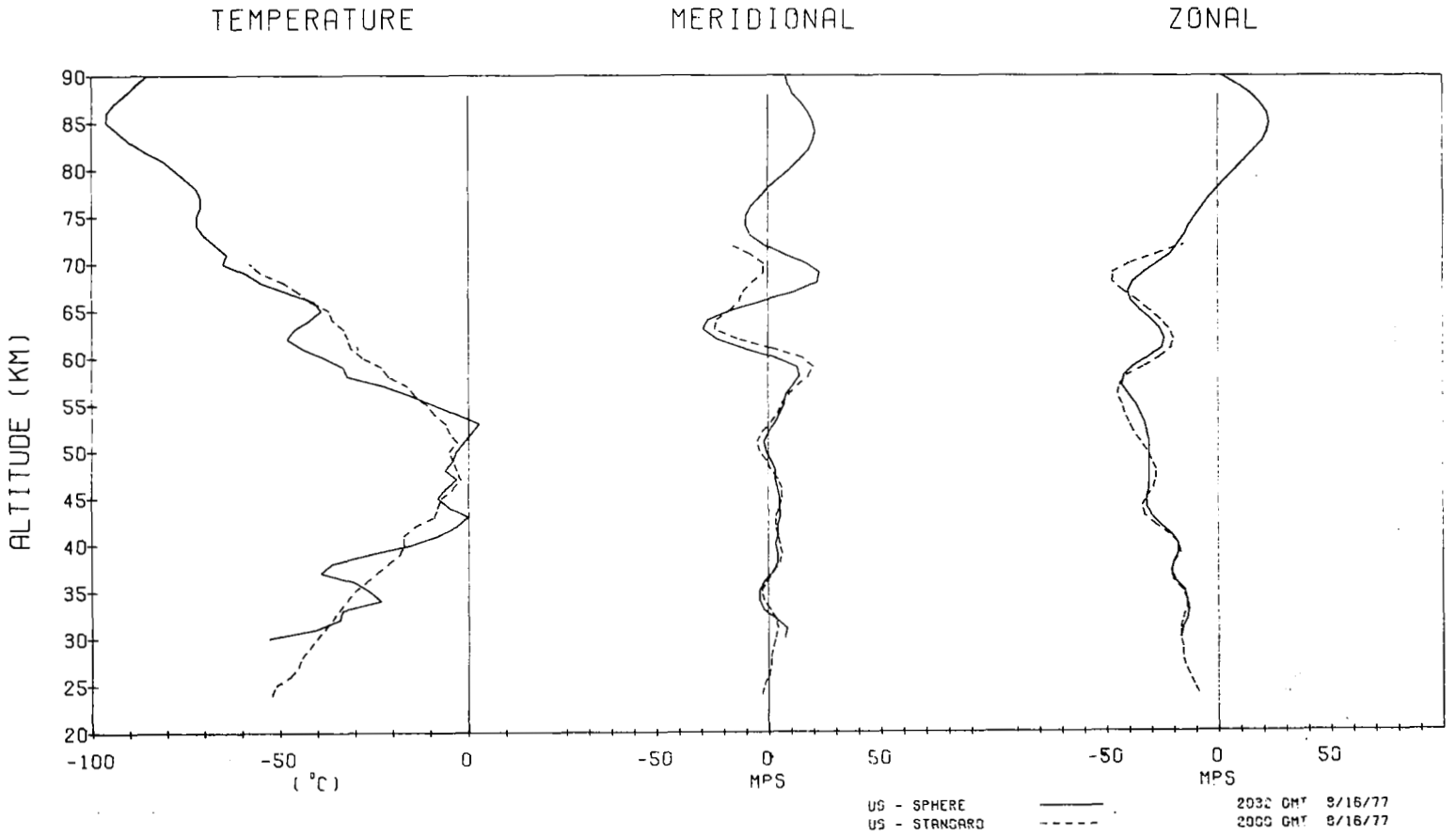
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(°C)
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MPS
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US - STANDARD
2030 GMT 9/16/77
2000 GMT 9/16/77

ALT	US - SPHERE AUG 19 1977 0125 GMT			US - STANDARD AUG 19 1977 0116 GMT			DIFFERENCES STD-SPHERE		
	TEMP	COMPONENT WINDS -1 M S		TEMP	COMPONENT WINDS -1 M S		TEMP	COMPONENT WINDS -1 M S	
KM	DEG C	NS	EW	DEG C	NS	EW	DEG C	NS	EW
93	-83	-1	17	999	999	999			
92	-82	-9	33	999	999	999			
91	-81	-15	47	999	999	999			
90	-81	-17	57	999	999	999			
89	-79	-17	64	999	999	999			
88	-77	-15	66	999	999	999			
87	-76	-12	63	999	999	999			
86	-76	-7	58	999	999	999			
85	-76	-2	51	999	999	999			
84	-76	4	42	999	999	999			
83	-78	10	33	999	999	999			
82	-77	15	24	999	999	999			
81	-76	20	15	999	999	999			
80	-77	24	6	999	999	999			
79	-78	26	-3	999	999	999			
78	-80	26	-11	999	999	999			
77	-80	24	-19	999	999	999			
76	-82	21	-25	999	999	999			
75	-83	15	-31	999	999	999			
74	-85	8	-35	999	999	999			
73	-86	-1	-37	999	999	999			
72	-85	-11	-37	999	-9	-20		2	17
71	-82	-20	-34	999	-8	-21		12	13
70	-82	-24	-26	-64	-7	-21	18	17	5
69	-71	-22	-14	-61	-6	-22	10	16	-8
68	-66	-12	-4	-57	-5	-24	9	7	-20
67	-57	0	-2	-53	-3	-29	4	-3	-27
66	-51	9	-10	-49	-1	-34	2	-10	-24
65	-49	9	-24	-45	-1	-39	4	-10	-15
64	-44	2	-38	-41	-4	-42	3	-6	-4
63	-40	-9	-44	-37	-9	-41	3	0	3
62	-35	-18	-42	-34	-14	-38	1	4	4
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60	-26	-23	-31	-25	-17	-29	1	6	2

ALT	TEMP	COMPONENT WINDS -1 M S		TEMP	COMPONENT WINDS -1 M S		TEMP	COMPONENT WINDS -1 M S	
KM	DEG C	NS	EW	DEG C	NS	EW	DEG C	NS	EW
59	-20	-21	-28	-22	-16	-26	-2	5	2
58	-14	-17	-26	-19	-13	-25	-5	4	1
57	-15	-13	-26	-20	-8	-25	-5	5	1
56	-17	-11	-27	-21	-5	-27	-4	6	0
55	-18	-10	-29	-18	-4	-28	0	6	1
54	-16	-7	-29	-15	-4	-28	1	3	1
53	-11	-1	-28	-13	-2	-27	-2	-1	1
52	-4	4	-27	-10	1	-26	-6	-3	1
51	-1	5	-25	-7	3	-25	-6	-2	0
50	1	4	-22	-4	3	-23	-5	-1	-1
49	-5	2	-21	-2	2	-21	3	0	0
48	-2	1	-21	-4	2	-21	-2	1	0
47	-5	0	-23	-7	1	-24	-2	1	-1
46	-8	-2	-26	-5	-1	-28	3	1	-2
45	-11	-5	-28	-6	-5	-30	5	0	-2
44	-8	-8	-29	-6	-9	-31	2	-1	-2
43	-11	-8	-28	-17	-10	-28	-6	-2	0
42	-17	-5	-26	-19	-7	-24	-2	-2	2
41	-22	-1	-23	-20	-3	-20	2	-2	3
40	-21	2	-17	-22	1	-16	-1	-1	1
39	-17	3	-13	-22	3	-13	-5	0	0
38	-19	2	-13	-25	3	-13	-6	1	0
37	-28	0	-16	-29	1	-16	-1	1	0
36	-33	-3	-21	-32	0	-19	1	3	2
35	-35	-2	-22	-32	-1	-19	3	1	3
34	999	999	999	-34	-2	-17			
33	999	999	999	-39	-2	-14			
32	999	999	999	-42	-2	-12			
31	999	999	999	-42	0	-13			
30	999	999	999	-43	0	-13			
29	999	999	999	-44	1	-13			
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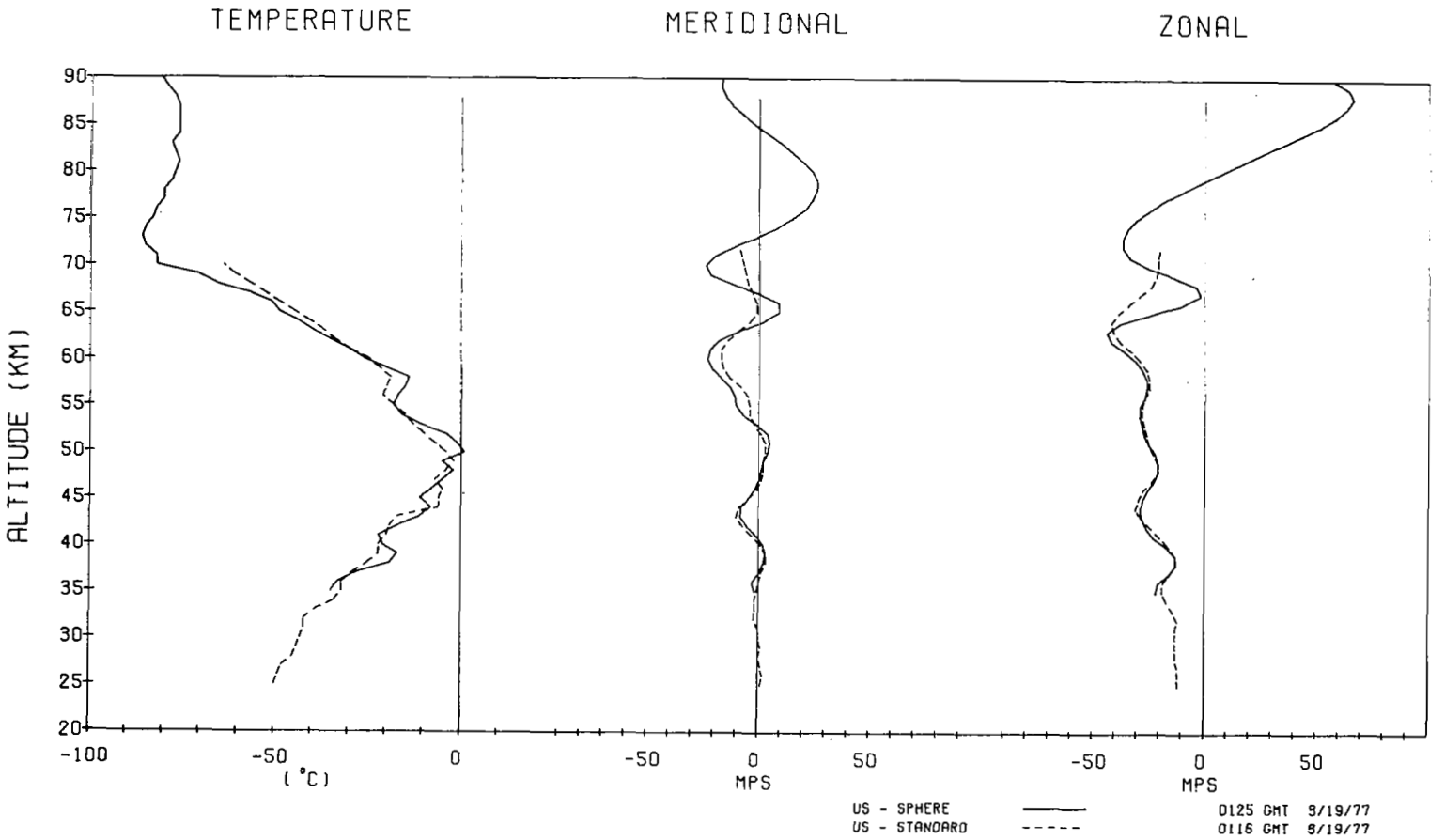
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0116 GMT 9/19/77

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KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
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93	-81	20	-22	999	999	999			
92	-81	13	-27	999	999	999			
91	-82	5	-30	999	999	999			
90	-85	-4	-32	999	999	999			
89	-85	-13	-32	999	999	999			
88	-85	-19	-30	999	999	999			
87	-84	-24	-28	999	999	999			
86	-81	-26	-26	999	999	999			
85	-78	-25	-23	999	999	999			
84	-77	-23	-20	999	999	999			
83	-77	-19	-18	999	999	999			
82	-77	-14	-15	999	999	999			
81	-79	-9	-12	999	999	999			
80	-82	-3	-9	999	999	999			
79	-84	3	-7	999	999	999			
78	-83	7	-5	999	999	999			
77	-80	11	-3	999	999	999			
76	-77	12	-3	999	999	999			
75	-71	12	-4	999	999	999			
74	-67	9	-6	999	999	999			
73	-64	3	-11	999	999	999			
72	-64	-5	-18	999	999	999			
71	-67	-15	-27	999	999	999			
70	-75	-25	-35	999	999	999			
69	-73	-32	-41	-61	-34	-56	12	-2	-15
68	-69	-33	-40	-59	-39	-47	10	-6	-7
67	-65	-27	-34	-53	-38	-36	12	-11	-2
66	-55	-17	-28	-49	-28	-29	6	-11	-1
65	-51	-9	-31	-48	-14	-33	3	-5	-2
64	-50	-8	-41	-46	-6	-47	4	2	-6
63	-47	-12	-53	-43	-7	-61	4	5	-8
62	-43	-17	-60	-40	-11	-67	3	6	-7
61	-36	-17	-58	-36	-13	-64	0	4	-6
60	-29	-16	-51	-30	-13	-55	-1	3	-4
59	-24	-15	-44	-27	-14	-46	-3	1	-2
58	-24	-18	-39	-25	-19	-40	-1	-1	-1
57	-20	-22	-36	-22	-23	-36	-2	-1	0
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55	-14	-16	-33	-19	-19	-32	-5	-3	1
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51	-8	-2	-33	-11	-1	-35	-3	1	-2
50	-5	-2	-34	-10	-1	-35	-5	1	-1
49	-2	-4	-33	-7	-3	-34	-5	1	-1
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45	-7	-3	-30	-10	-4	-30	-3	-1	0
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43	-14	-5	-29	-14	-4	-29	0	1	0
42	-21	-5	-26	-18	-2	-25	3	3	1
41	-24	-3	-24	-19	0	-22	5	3	2
40	-29	-3	-22	-21	-1	-20	8	2	2
39	-27	-4	-19	-25	-3	-19	2	1	0
38	-24	-3	-17	-26	-3	-17	-2	0	0
37	-31	0	-17	-28	1	-17	3	1	0
36	-37	3	-18	-31	5	-18	6	2	0
35	-37	5	-19	-33	5	-20	4	0	-1
34	-33	3	-19	-35	2	-19	-2	-1	0
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32	999	999	999	-36	-2	-14			
31	999	999	999	-39	-2	-13			
30	999	999	999	-42	-2	-14			
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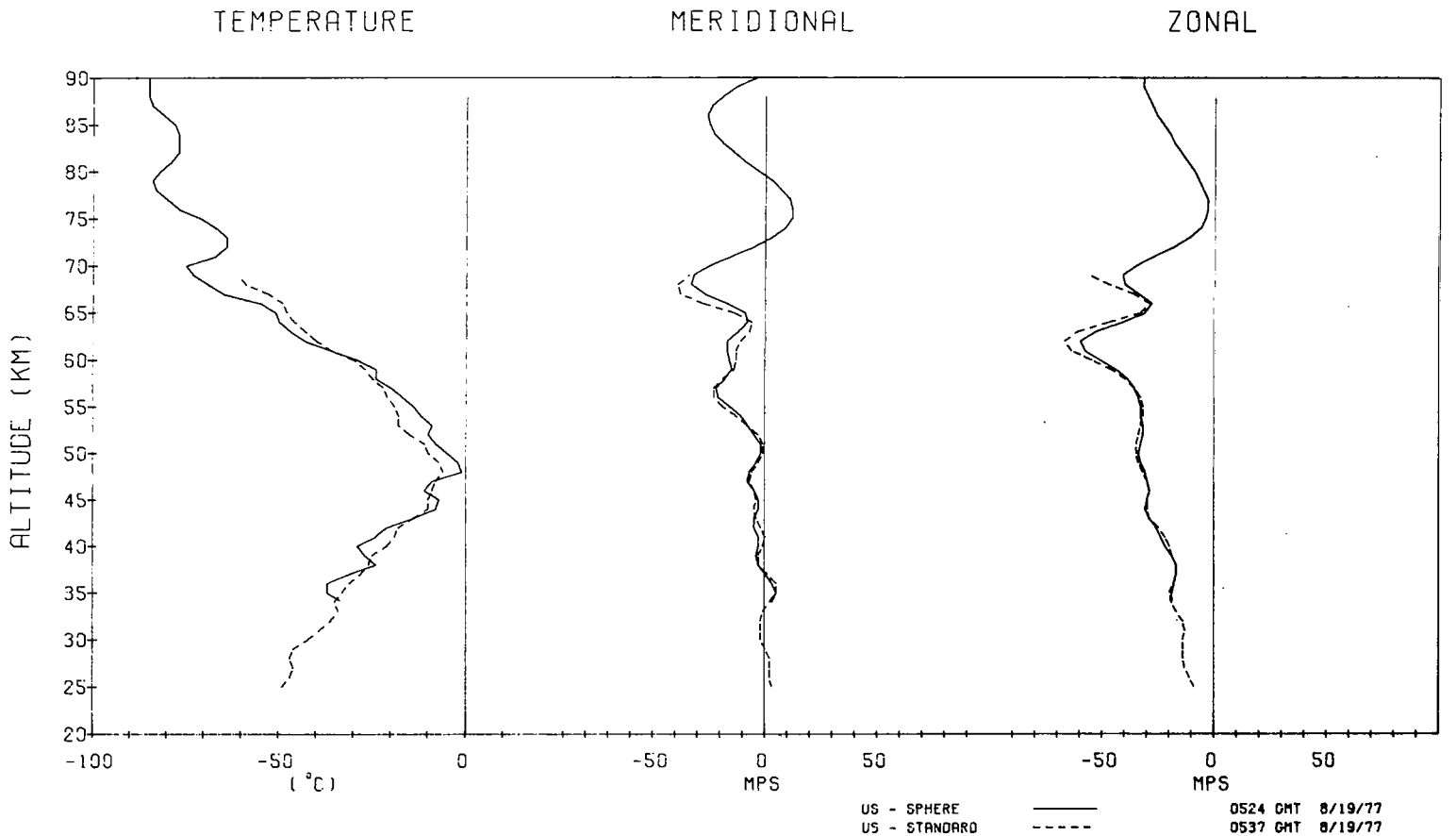
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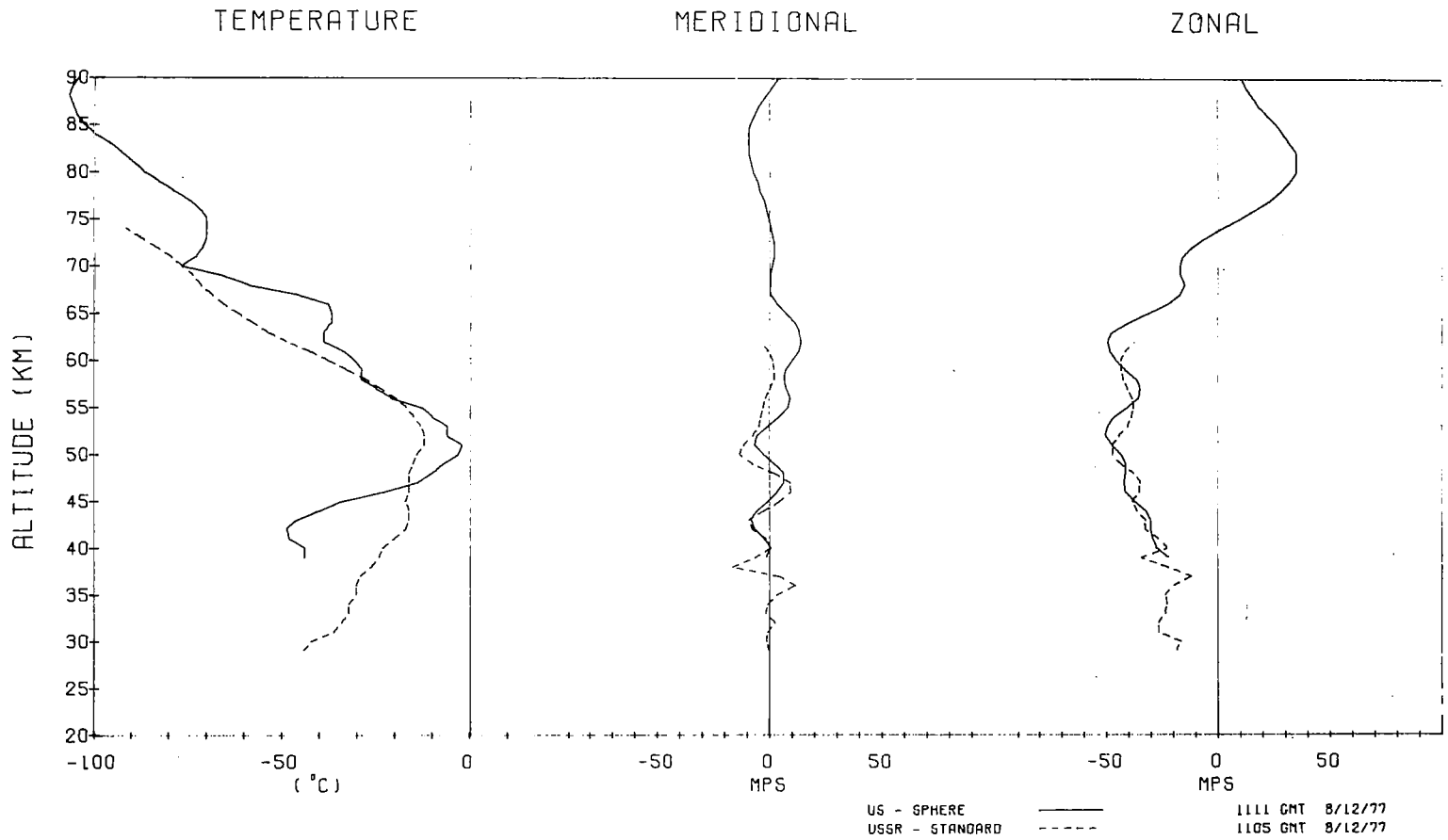
25
20
-100
-50
0
(°C)
-50
0
50
MPS
-50
0
50
MPS
US - SPHERE
US - STANDARD
0524 GMT 8/19/77
0537 GMT 8/19/77

APPENDIX D

LISTINGS AND PLOTS OF USSR(STANDARD) AND US(SPHERE) DATA

The data of Appendix D is similar to Appendix C except that data from the USSR(standard) technique is compared with the Sphere data.

ALT	US - SPHERE AUG 12 1977 1111 GMT			USSR - STANDARD AUG 12 1977 1105 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
93	-90	13	2	999	999	999			
92	-95	10	5	999	999	999			
91	-100	8	8	999	999	999			
90	-104	4	10	999	999	999			
89	-106	1	12	999	999	999			
88	-107	-2	15	999	999	999			
87	-106	-5	18	999	999	999			
86	-105	-7	22	999	999	999			
85	-103	-9	26	999	999	999			
84	-100	-10	29	999	999	999			
83	-96	-10	32	999	999	999			
82	-93	-10	35	999	999	999			
81	-90	-9	35	999	999	999			
80	-87	-8	35	999	999	999			
79	-83	-6	32	999	999	999			
78	-79	-5	28	999	999	999			
77	-75	-3	23	999	999	999			
76	-72	-2	16	999	999	999			
75	-70	-1	9	999	999	999			
74	-70	0	1	-92	999	999	-22		
73	-70	1	-6	-88	999	999	-18		
72	-71	2	-12	-84	999	999	-13		
71	-73	2	-16	-80	999	999	-7		
70	-77	1	-17	-77	999	999	0		
69	-66	0	-17	-74	999	999	-8		
68	-59	0	-15	-72	999	999	-13		
67	-46	0	-17	-69	999	999	-23		
66	-38	3	-23	-66	999	999	-28		
65	-37	7	-32	-62	999	999	-25		
64	-37	11	-41	-58	999	999	-21		
63	-39	13	-48	-54	999	999	-15		
62	-39	14	-50	-49	-4	-38	-10	-18	12
61	-34	13	-49	-43	-1	-42	-9	-14	7
60	-31	10	-46	-38	1	-44	-7	-9	2
59	-29	7	-42	-33	2	-44	-4	-5	-2
58	-29	6	-37	-28	2	-43	1	-4	-6
57	-25	7	-35	-24	0	-41	1	-7	-6
56	-21	9	-36	-20	-2	-39	1	-11	-3
55	-13	8	-41	-17	-3	-38	-4	-11	3
54	-10	4	-47	-15	-4	-39	-5	-8	8
53	-6	-1	-50	-13	-5	-41	-7	-4	9
52	-6	-6	-51	-12	-8	-45	-6	-2	6
51	-2	-7	-48	-12	-12	-48	-10	-5	0
50	-3	-3	-44	-14	-14	-48	-11	-11	-4
49	-7	2	-42	-15	-8	-44	-8	-10	-2
48	-10	6	-42	-16	2	-38	-6	-4	4
47	-14	6	-43	-16	9	-35	-2	3	8
46	-23	3	-42	-16	9	-36	7	6	6
45	-34	-1	-38	-17	4	-39	17	5	-1
44	-40	-6	-33	-16	-3	-37	24	3	-4
43	-46	-9	-31	-16	-10	-33	30	-1	-2
42	-49	-7	-31	-17	-8	-33	32	-1	-2
41	-48	-3	-30	-20	-2	-27	28	1	3
40	-44	0	-28	-23	0	-23	21	0	5
39	-44	-2	-23	-24	-7	-35	20	-5	-12
38	999	999	999	-26	-17	-23			
37	999	999	999	-29	4	-12			
36	999	999	999	-30	11	-20			
35	999	999	999	-30	3	-24			
34	999	999	999	-32	-1	-23			
33	999	999	999	-32	-2	-24			
32	999	999	999	-34	2	-27			
31	999	999	999	-36	-1	-27			
30	999	999	999	-42	-2	-17			
29	999	999	999	-44	-1	-19			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75
70
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35
30
25
20
-100
-50
0
(°C)
-50
0
50
MPS
-50
0
50
MPS
US - SPHERE
USSR - STANDARD
1111 GMT 8/12/77
1105 GMT 8/12/77

ALT	US - SPHERE AUG 15 1977 1942 GMT			USSR - STANDARD AUG 15 1977 1935 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
94	-81	-5	65	999	999	999			
93	-76	13	64	999	999	999			
92	-68	31	59	999	999	999			
91	-62	46	49	999	999	999			
90	-56	58	36	999	999	999			
89	-51	63	21	999	999	999			
88	-52	64	7	999	999	999			
87	-55	60	-6	999	999	999			
86	-60	53	-15	999	999	999			
85	-66	44	-21	999	999	999			
84	-73	35	-23	999	999	999			
83	-79	25	-22	999	999	999			
82	-83	17	-20	999	999	999			
81	-85	11	-16	999	999	999			
80	-87	6	-11	999	999	999			
79	-86	3	-5	999	999	999			
78	-83	2	-1	999	999	999			
77	-81	4	2	999	999	999			
76	-79	7	4	999	999	999			
75	-77	11	2	999	999	999			
74	-76	16	-2	-82	999	999	-6		
73	-75	20	-9	-78	999	999	-3		
72	-73	21	-19	-75	999	999	-2		
71	-68	19	-29	-72	999	999	-4		
70	-65	13	-39	-69	999	999	-4		
69	-62	7	-45	-66	999	999	-4		
68	-56	5	-46	-64	999	999	-8		
67	-49	5	-44	-61	999	999	-12		
66	-46	7	-40	-58	999	999	-12		
65	-44	6	-37	-55	999	999	-11		
64	-41	4	-36	-51	11	-34	-10	7	2
63	-40	3	-36	-47	10	-34	-7	7	2
62	-37	4	-38	-43	8	-34	-6	4	4
61	-36	5	-40	-38	5	-34	-2	0	6
60	-33	0	-39	-34	1	-34	-1	1	5
59	-28	-6	-37	-30	-3	-33	-2	3	4
58	-26	-9	-33	-26	-6	-33	0	3	0
57	-22	-5	-30	-23	-6	-34	-1	-1	-4
56	-17	4	-30	-19	-4	-37	-2	-8	-7
55	-16	11	-33	-16	2	-42	0	-9	-9
54	-15	13	-37	-13	7	-48	2	-6	-11
53	-11	12	-39	-11	11	-50	0	-1	-11
52	-14	12	-38	-9	10	-43	5	-2	-5
51	-8	13	-34	-9	8	-30	-1	-5	4
50	-4	15	-33	-8	8	-25	-4	-7	8
49	-1	15	-34	-7	11	-36	-6	-4	-2
48	3	14	-36	-6	12	-51	-9	-2	-15
47	6	12	-38	-5	10	-51	-11	-2	-13
46	4	7	-38	-5	8	-37	-9	1	1
45	3	1	-36	-5	4	-30	-8	3	6
44	0	-3	-32	-8	-1	-30	-8	2	2
43	-9	-2	-27	-15	2	-25	-6	4	2
42	-17	2	-22	-23	12	-22	-6	10	0
41	-20	5	-17	-24	12	-19	-4	7	-2
40	-25	7	-16	-24	11	-16	1	4	0
39	-24	5	-17	-25	13	-17	-1	8	0
38	-20	4	-18	-26	6	-24	-6	2	-6
37	-22	2	-18	-28	5	-25	-6	3	-7
36	-32	0	-17	-29	3	-18	3	3	-1
35	-34	-1	-15	-33	-5	-20	1	-4	-5
34	-44	1	-14	-35	1	-14	9	0	0
33	-33	4	-14	-36	2	-4	-3	-2	10
32	-21	5	-15	-37	5	-15	-16	0	0
31	-22	2	-16	-39	-1	-15	-17	-3	1
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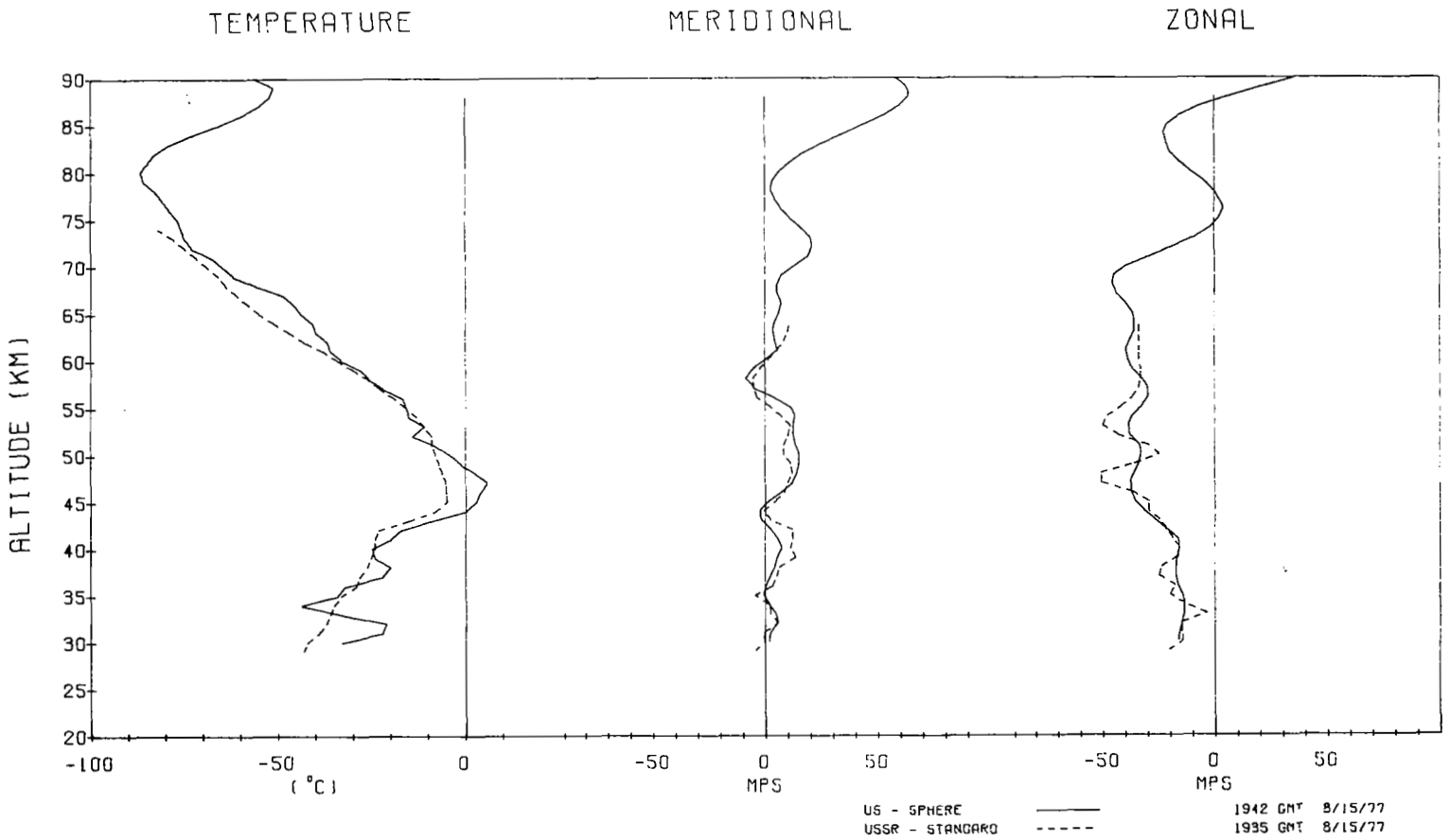
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-50
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(°C)
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0
50
MPS
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MPS
US - SPHERE
USSR - STANDARD
1942 GMT 8/15/77
1935 GMT 8/15/77

ALT	US - SPHERE AUG 16 1977 0123 GMT			USSR - STANDARD AUG 16 1977 0105 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
93	-87	-71	51	999	999	999			
92	-85	-65	63	999	999	999			
91	-82	-57	74	999	999	999			
90	-78	-47	81	999	999	999			
89	-74	-35	85	999	999	999			
88	-72	-22	84	999	999	999			
87	-72	-11	79	999	999	999			
86	-72	0	72	999	999	999			
85	-73	8	64	999	999	999			
84	-76	12	55	999	999	999			
83	-80	14	46	999	999	999			
82	-82	14	38	999	999	999			
81	-84	11	31	999	999	999			
80	-86	7	25	999	999	999			
79	-85	1	20	999	999	999			
78	-83	-5	16	999	999	999			
77	-80	-11	13	999	999	999			
76	-78	-16	11	999	999	999			
75	-77	-19	10	999	999	999			
74	-75	-19	8	999	999	999			
73	-74	-17	6	999	999	999			
72	-72	-12	1	999	999	999			
71	-69	-5	-5	999	999	999			
70	-68	0	-13	999	999	999			
69	-62	0	-22	999	999	999			
68	-58	-5	-31	999	999	999			
67	-55	-11	-36	999	999	999			
66	-51	-15	-37	999	-37	11		-22	48
65	-50	-15	-34	-62	-36	10	-12	-21	44
64	-46	-13	-27	-53	-34	6	-7	-21	33
63	-36	-11	-21	-44	-29	1	-8	-18	22
62	-31	-9	-20	-35	-23	-6	-4	-14	14
61	-28	-7	-25	-27	-15	-15	1	-8	10
60	-23	-5	-33	-20	-6	-25	3	-1	8
59	-19	-4	-38	-14	3	-36	5	7	2
58	-18	-3	-40	-11	12	-46	7	15	-6
57	-17	1	-38	-9	18	-53	8	17	-15
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47	-11	-7	-24	-4	-7	-29	7	0	-5
46	-11	-2	-19	-6	-13	-24	5	-11	-5
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44	-8	5	-23	-8	4	-24	0	-1	-1
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37	999	999	999	-23	-4	-18			
36	999	999	999	-28	4	-25			
35	999	999	999	-31	2	-27			
34	999	999	999	-34	-1	-25			
33	999	999	999	-36	-12	-15			
32	999	999	999	-36	-4	-10			
31	999	999	999	-36	2	-18			
30	999	999	999	-37	-3	-17			
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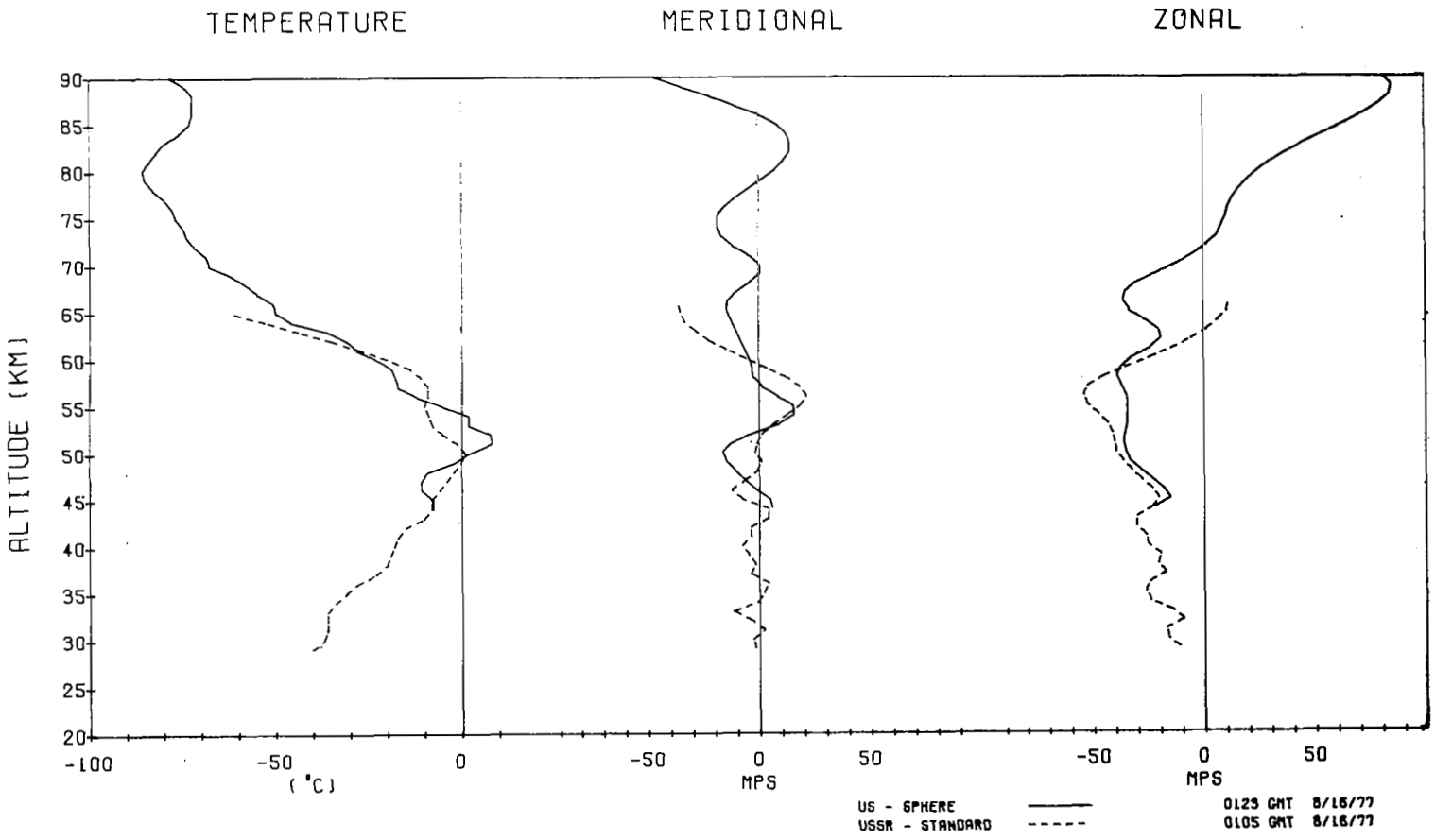
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-100
-50
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(°C)
-50
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50
MPS
-50
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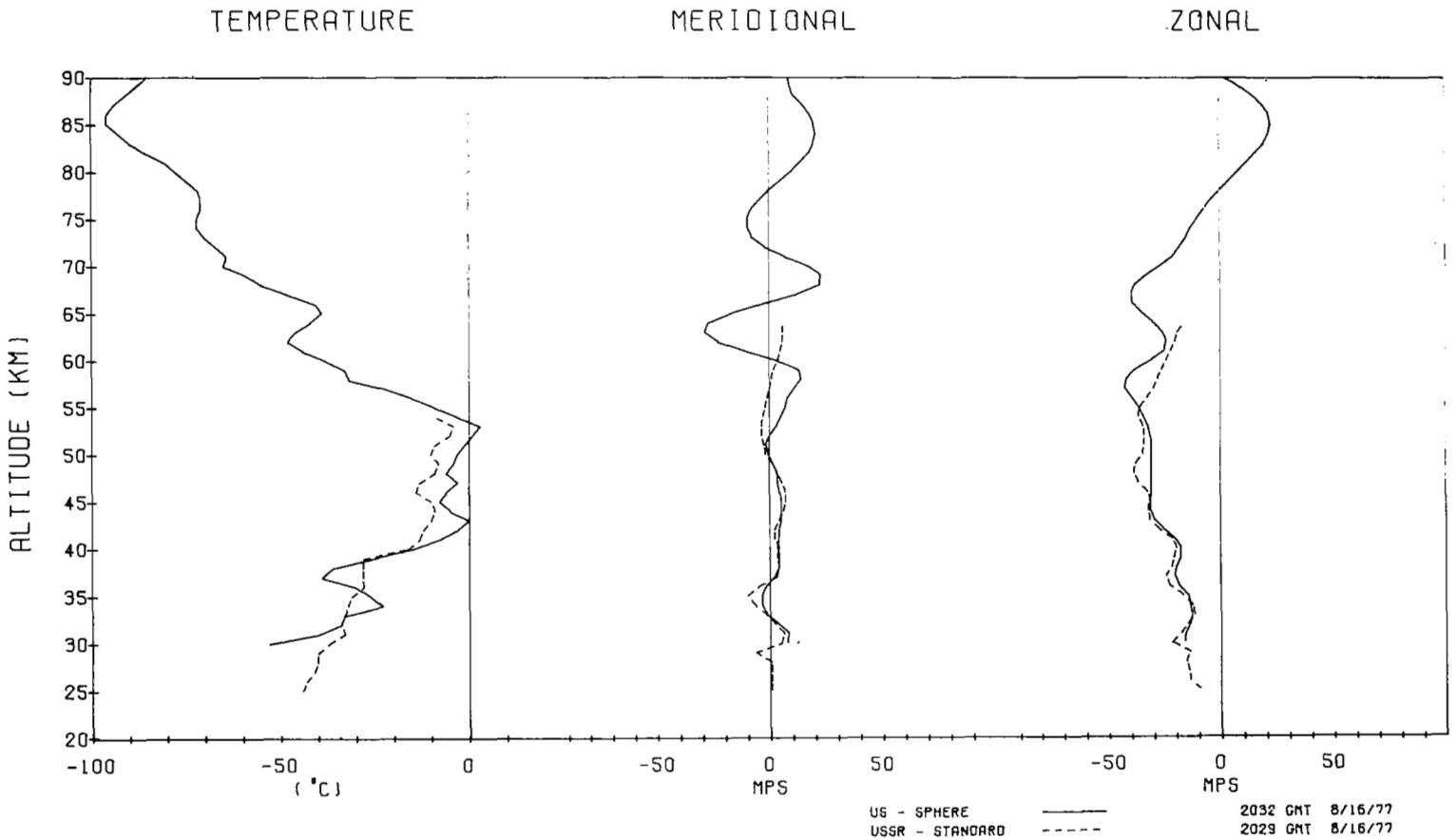
MPS
US - 6PHERE
USSR - STANDARD
0123 GMT 8/16/77
0105 GMT 8/16/77

ALT	US - SPHERE AUG 16 1977 2032 GMT			USSR - STANDARD AUG 16 1977 2029 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S		DEG C	M S		DEG C	M S	
		NS	EW		NS	EW		NS	EW
94	-86	9	-22	999	999	999			
93	-83	8	-18	999	999	999			
92	-81	7	-13	999	999	999			
91	-81	7	-6	999	999	999			
90	-85	8	2	999	999	999			
89	-88	9	9	999	999	999			
88	-91	11	15	999	999	999			
87	-94	15	19	999	999	999			
86	-96	18	22	999	999	999			
85	-96	20	23	999	999	999			
84	-93	21	22	999	999	999			
83	-90	20	20	999	999	999			
82	-86	18	16	999	999	999			
81	-81	14	12	999	999	999			
80	-78	10	8	999	999	999			
79	-75	5	4	999	999	999			
78	-72	0	0	999	999	999			
77	-71	-4	-4	999	999	999			
76	-71	-8	-7	999	999	999			
75	-72	-10	-10	999	999	999			
74	-72	-10	-13	999	999	999			
73	-70	-8	-15	999	999	999			
72	-67	-2	-18	999	999	999			
71	-64	7	-21	999	999	999			
70	-65	17	-27	999	999	999			
69	-59	23	-33	999	999	999			
68	-55	22	-38	999	999	999			
67	-48	12	-40	999	999	999			
66	-41	-3	-39	999	999	999			
65	-39	-17	-35	999	999	999			
64	-42	-27	-30	999	6	-16		33	14
63	-46	-29	-26	999	6	-19		35	7
62	-48	-23	-24	999	6	-20		29	4
61	-44	-11	-25	999	5	-22		16	3
60	-38	3	-31	999	4	-24		1	7
59	-33	13	-38	999	2	-26		-11	12
58	-32	14	-42	999	1	-28		-13	14
57	-22	11	-43	999	0	-30		-11	13
56	-15	8	-40	999	-1	-33		-9	7
55	-9	7	-37	999	-2	-36		-9	1
54	-3	5	-35	-9	-3	-37	-6	-8	-2
53	3	3	-33	-4	-4	-35	-7	-7	-2
52	1	0	-32	-5	-4	-34	-6	-4	-2
51	-1	-2	-31	-9	-3	-34	-8	-1	-3
50	-3	-1	-31	-10	-2	-35	-7	-1	-4
49	-4	1	-31	-8	1	-38	-4	0	-7
48	-6	3	-31	-9	3	-39	-3	0	-8
47	-3	3	-31	-13	5	-37	-10	2	-6
46	-6	4	-31	-14	7	-33	-8	3	-2
45	-8	5	-32	-10	7	-32	-2	2	0
44	-5	5	-32	-9	6	-33	-4	1	-1
43	0	5	-30	-10	4	-32	-10	-1	-2
42	-3	4	-26	-12	2	-28	-9	-2	-2
41	-8	4	-21	-13	2	-22	-5	-2	-1
40	-15	3	-18	-16	4	-20	-1	1	-2
39	-26	4	-18	-28	3	-21	-2	-1	-3
38	-36	4	-20	-28	4	-22	8	0	-2
37	-39	2	-21	-28	3	-25	11	1	-4
36	-30	-2	-19	-28	-5	-23	2	-3	-4
35	-26	-4	-15	-31	-10	-17	-5	-6	-2
34	-23	-4	-14	-32	-7	-13	-9	-3	1
33	-33	-2	-13	-33	-2	-12	0	0	1
32	-34	3	-14	-34	2	-15	0	-1	-1
31	-40	8	-16	-33	6	-18	7	-2	-2
30	-53	7	-17	-37	5	-22	16	-2	-5
29	999	999	999	-40	-7	-14			
28	999	999	999	-40	0	-16			
27	999	999	999	-41	0	-15			


TEMPERATURE
MERIDIONAL
ZONAL
ALTITUDE (KM)
90
85
80
75
70
65
60
55
50
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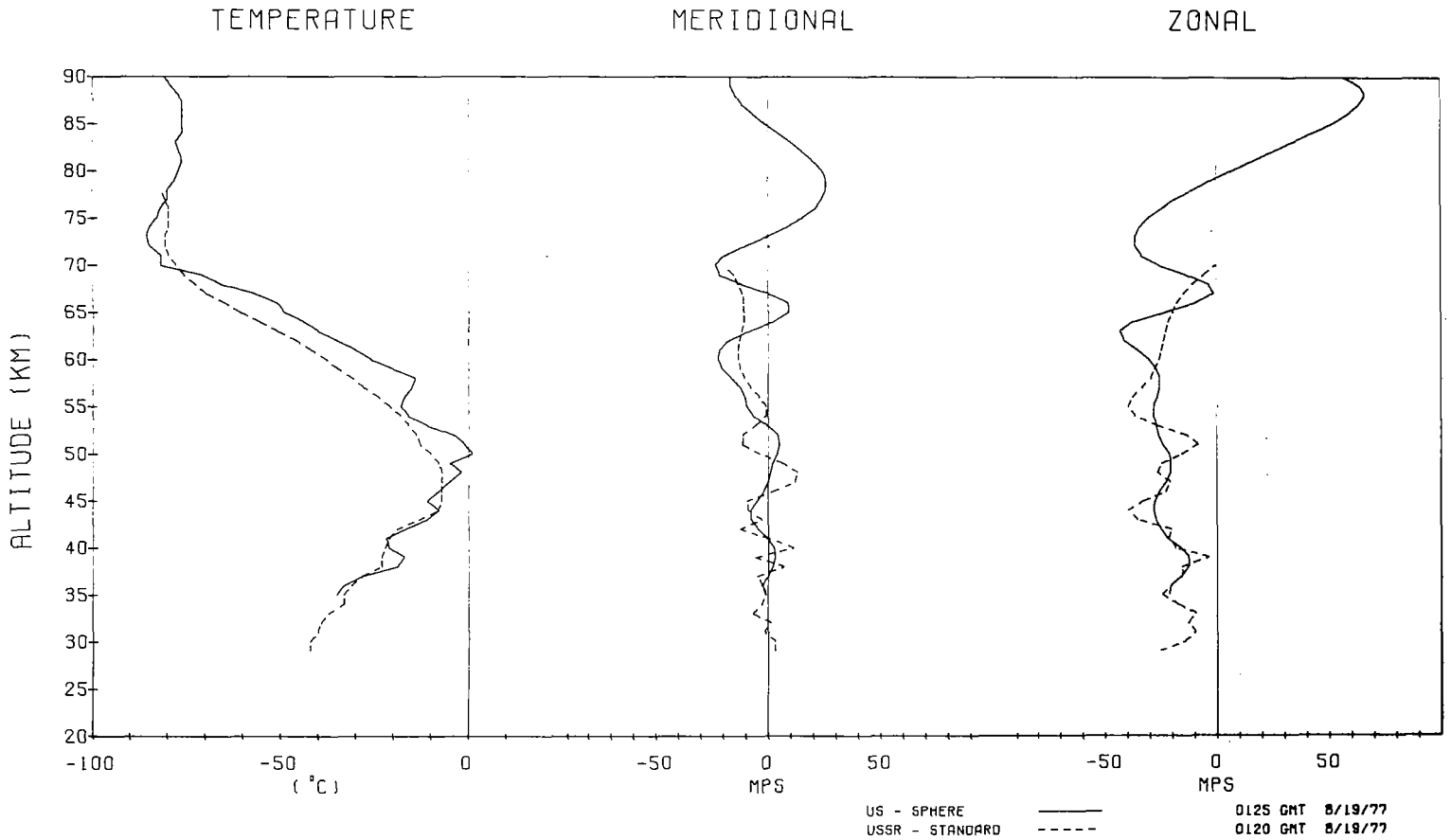
40
35
30
25
20
-100
-50
0
(°C)
-50
0
50
MPS
-50
0
50
MPS
US - SPHERE
USSR - STANDARD
2032 GMT 8/16/77
2029 GMT 8/16/77

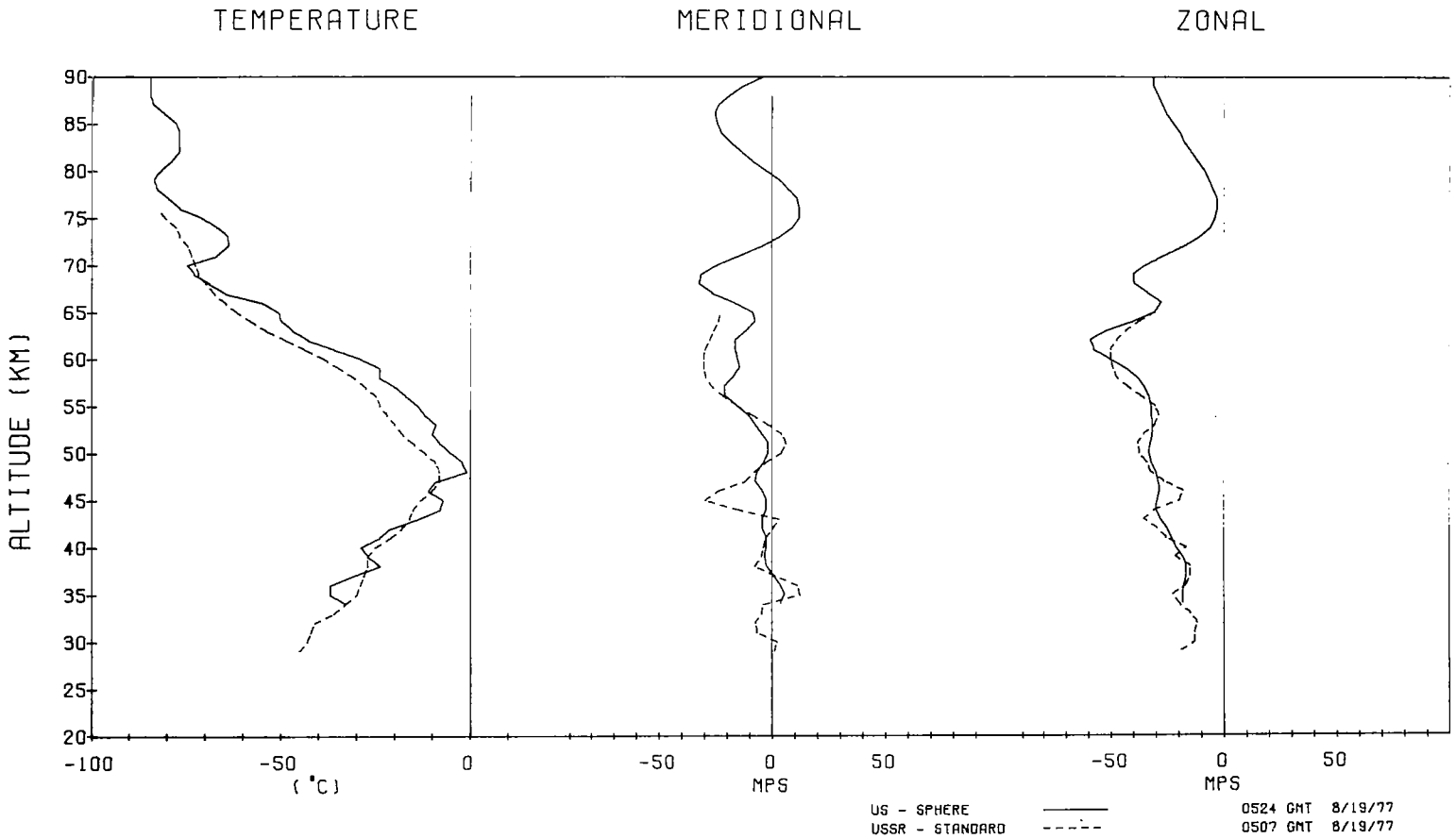
ALT	US - SPHERE AUG 19 1977 0125 GMT			USSR - STANDARD AUG 19 1977 0120 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DLG C	M S NS	EW
93	-83	-1	17	999	999	999			
92	-82	-9	33	999	999	999			
91	-81	-15	47	999	999	999			
90	-81	-17	57	999	999	999			
89	-79	-17	64	999	999	999			
88	-77	-15	66	999	999	999			
87	-76	-12	63	999	999	999			
86	-76	-7	58	999	999	999			
85	-76	-2	51	999	999	999			
84	-76	4	42	999	999	999			
83	-78	10	33	999	999	999			
82	-77	15	24	999	999	999			
81	-76	20	15	999	999	999			
80	-77	24	6	999	999	999			
79	-78	26	-3	999	999	999			
78	-80	26	-11	-82	999	999	-2		
77	-80	24	-19	-81	999	999	-1		
76	-82	21	-25	-80	999	999	2		
75	-83	15	-31	-80	999	999	3		
74	-85	8	-35	-80	999	999	5		
73	-86	-1	-37	-81	999	999	5		
72	-85	-11	-37	-81	999	999	4		
71	-82	-20	-34	-80	999	999	2		
70	-82	-24	-26	-78	-20	-1	4	4	25
69	-71	-22	-14	-76	-16	-6	-5	6	8
68	-66	-12	-4	-73	-14	-11	-7	-2	-7
67	-57	0	-2	-70	-12	-15	-13	-12	-13
66	-51	9	-10	-65	-11	-18	-14	-20	-8
65	-49	9	-24	-61	-11	-20	-12	-20	4
64	-44	2	-38	-56	-11	-22	-12	-13	16
63	-40	-9	-44	-51	-12	-23	-11	-3	21
62	-35	-18	-42	-46	-13	-24	-11	5	18
61	-30	-22	-36	-42	-14	-25	-12	8	11
60	-26	-23	-31	-36	-14	-26	-12	9	5

ALT	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
59	-20	-21	-28	-35	-13	-28	-15	8	0
58	-14	-17	-26	-31	-11	-30	-17	6	-4
57	-15	-13	-26	-28	-8	-34	-13	5	-8
56	-17	-11	-27	-24	-4	-38	-7	7	-11
55	-18	-10	-29	-21	-1	-40	-3	9	-11
54	-16	-7	-29	-18	-1	-37	-2	6	-8
53	-11	-1	-28	-16	-6	-27	-5	-5	1
52	-4	4	-27	-14	-12	-14	-10	-16	13
51	-1	5	-25	-13	-12	-9	-12	-17	16
50	1	4	-22	-10	-4	-16	-11	-8	6
49	-5	2	-21	-8	6	-25	-3	4	-4
48	-2	1	-21	-7	13	-27	-5	12	-6
47	-5	0	-23	-7	12	-21	-2	12	2
46	-8	-2	-26	-7	2	-23	1	4	3
45	-11	-5	-28	-7	-10	-33	4	-5	-5
44	-8	-8	-29	-8	-9	-40	0	-1	-11
43	-11	-8	-28	-13	-3	-36	-2	5	-8
42	-17	-5	-26	-19	-13	-21	-2	-8	5
41	-22	-1	-23	-21	0	-22	1	1	1
40	-21	2	-17	-22	11	-19	-1	9	-2
39	-17	3	-13	-23	-6	-4	-6	-9	9
38	-19	2	-13	-23	7	-16	-4	5	-3
37	-28	0	-16	-28	-5	-16	0	-5	0
36	-33	-3	-21	-31	-3	-21	2	0	0
35	-35	-2	-22	-33	-1	-25	2	1	-3
34	999	999	999	-33	-3	-18			
33	999	999	999	-37	-7	-10			
32	999	999	999	-39	1	-13			
31	999	999	999	-40	-2	-10			
30	999	999	999	-42	3	-15			
29	999	999	999	-42	3	-26			


TEMPERATURE
MERIDIONAL
ZONAL
ALTITUDE (KM)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
-100
-50
0
(°C)
-50
0
50
MPS
-50
0
50
MPS
US - SPHERE
USSR - STANDARD
0125 GMT 8/19/77
0120 GMT 8/19/77

	US - SPHERE AUG 19 1977 0524 GMT			USSR - STANDARD AUG 19 1977 0507 GMT			DIFFERENCES USSR-US		
ALT	TEMP	COMPONENT WINDS -1 M S		TEMP	COMPONENT WINDS -1 M S		TEMP	COMPONENT WINDS -1 M S	
KM	DEG C	NS	EW	DEG C	NS	EW	DEG C	NS	EW
94	-80	23	-16	999	999	999			
93	-81	20	-22	999	999	999			
92	-81	13	-27	999	999	999			
91	-82	5	-30	999	999	999			
90	-85	-4	-32	999	999	999			
89	-85	-13	-32	999	999	999			
88	-85	-19	-30	999	999	999			
87	-84	-24	-28	999	999	999			
86	-81	-26	-26	999	999	999			
85	-78	-25	-23	999	999	999			
84	-77	-23	-20	999	999	999			
83	-77	-19	-18	999	999	999			
82	-77	-14	-15	999	999	999			
81	-79	-9	-12	999	999	999			
80	-82	-3	-9	999	999	999			
79	-84	3	-7	999	999	999			
78	-83	7	-5	999	999	999			
77	-80	11	-3	999	999	999			
76	-77	12	-3	-83	999	999	-6		
75	-71	12	-4	-81	999	999	-10		
74	-67	9	-6	-78	999	999	-11		
73	-64	3	-11	-77	999	999	-13		
72	-64	-5	-18	-75	999	999	-11		
71	-67	-15	-27	-74	999	999	-7		
70	-75	-25	-35	-73	999	999	2		
69	-73	-32	-41	-72	999	999	1		
68	-69	-33	-40	-70	999	999	-1		
67	-65	-27	-34	-68	999	999	-3		
66	-55	-17	-28	-65	999	999	-10		
65	-51	-9	-31	-62	-23	-31	-11	-14	0
64	-50	-8	-41	-58	-24	-38	-8	-16	3
63	-47	-12	-53	-54	-26	-44	-7	-14	9
62	-43	-17	-60	-49	-28	-48	-6	-11	12
61	-36	-17	-58	-44	-30	-51	-8	-13	7

ALT	TEMP	COMPONENT WINDS -1 M S		TEMP	COMPONENT WINDS -1 M S		TEMP	COMPONENT WINDS -1 M S	
KM	DEG C	NS	EW	DEG C	NS	EW	DEG C	NS	EW
60	-29	-16	-51	-39	-31	-51	-10	-15	0
59	-24	-15	-44	-35	-31	-50	-11	-16	-6
58	-24	-18	-39	-31	-30	-48	-7	-12	-9
57	-20	-22	-36	-28	-27	-43	-8	-5	-7
56	-17	-21	-34	-25	-22	-37	-8	-1	-3
55	-14	-16	-33	-24	-16	-31	-10	0	2
54	-12	-11	-33	-22	-9	-29	-10	2	4
53	-9	-8	-32	-20	-2	-31	-11	6	1
52	-10	-5	-32	-18	4	-36	-8	9	-4
51	-8	-2	-33	-15	6	-39	-7	8	-6
50	-5	-2	-34	-12	4	-38	-7	6	-4
49	-2	-4	-33	-9	-3	-35	-7	1	-2
48	-1	-7	-31	-8	-8	-33	-7	-1	-2
47	-9	-8	-30	-8	-12	-27	1	-4	3
46	-11	-5	-29	-10	-24	-18	1	-19	11
45	-7	-3	-30	-13	-30	-20	-6	-27	10
44	-8	-3	-31	-15	-15	-31	-7	-12	0
43	-14	-5	-29	-16	3	-36	-2	8	-7
42	-21	-5	-26	-18	0	-30	3	5	-4
41	-24	-3	-24	-21	-3	-26	3	0	-2
40	-29	-3	-22	-25	-4	-17	4	-1	5
39	-27	-4	-19	-27	-5	-22	0	-1	-3
38	-24	-3	-17	-27	-8	-15	-3	-5	2
37	-31	0	-17	-28	1	-15	3	1	2
36	-37	3	-18	-29	11	-17	8	8	1
35	-37	5	-19	-30	12	-23	7	7	-4
34	-33	3	-19	-33	-4	-20	0	-7	-1
33	999	999	999	-36	-5	-15			
32	999	999	999	-41	-8	-12			
31	999	999	999	-42	-7	-13			
30	999	999	999	-43	2	-13			
29	999	999	999	-45	1	-19			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MERIDIONAL
ZONAL
ALTITUDE (KM)
90
85
80
75
70
65
60
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50
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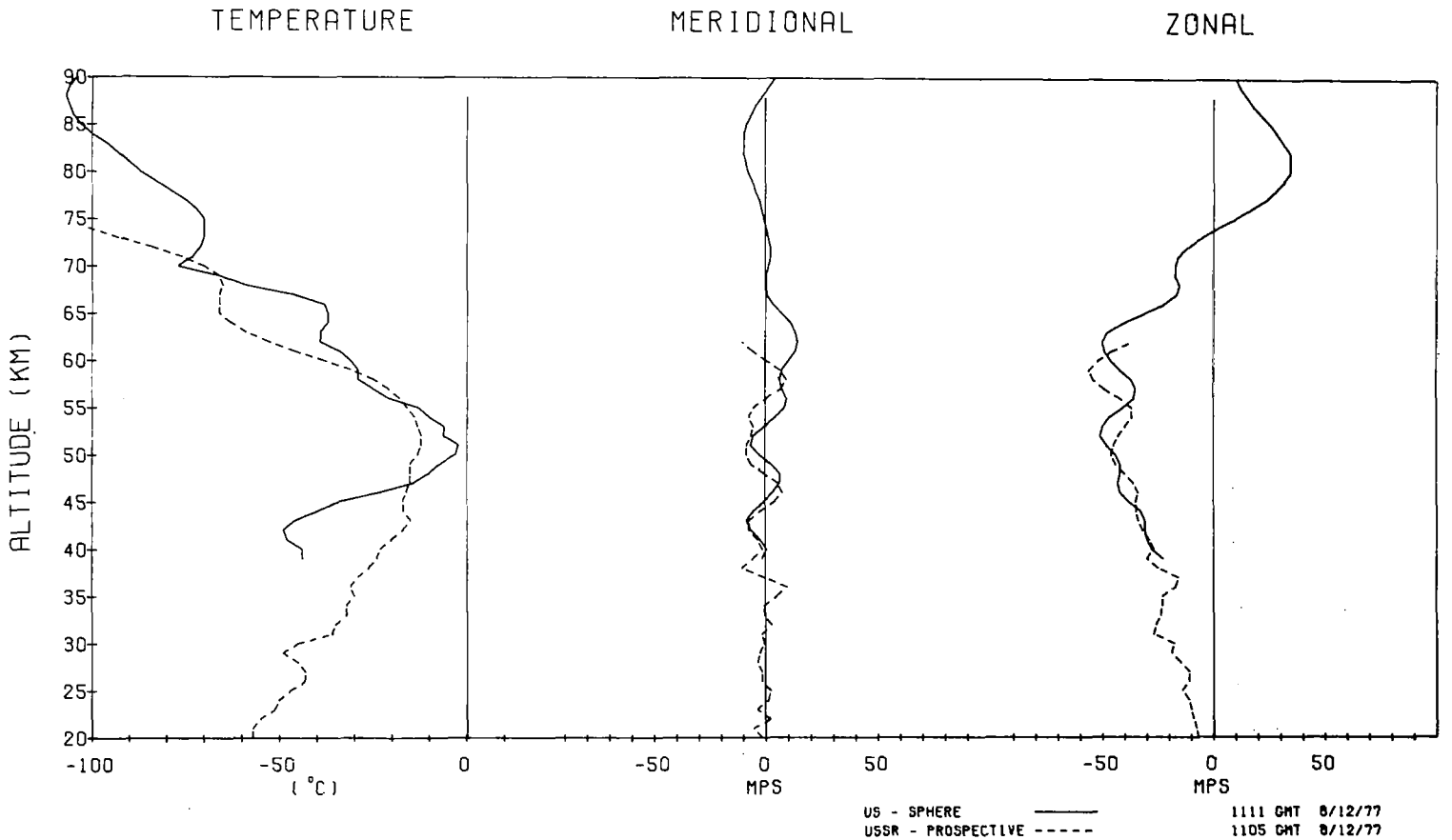
40
35
30
25
20
-100
-50
0
(°C)
-50
0
50
MPS
-50
0
50
MPS
US - SPHERE
USSR - STANDARD
0524 GMT 8/19/77
0507 GMT 8/19/77

APPENDIX E

LISTINGS AND PLOTS OF USSR(PROSPECTIVE) AND US(SPHERE) DATA

Appendix E is similar to Appendixes C and D except the comparison is US Sphere technique with the USSR(prospective) technique.

ALT	US - SPHERE AUG 12 1977 1111 GMT			USSR - PROSPECTIVE AUG 12 1977 1105 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS $M\ S^{-1}$		TEMP	COMPONENT WINDS $M\ S^{-1}$		TEMP	COMPONENT WINDS $M\ S^{-1}$	
KM	DEG C	NS	EW	DEG C	NS	EW	DEG C	NS	EW
93	-90	13	2	999	999	999			
92	-95	10	5	999	999	999			
91	-100	8	8	999	999	999			
90	-104	4	10	999	999	999			
89	-106	1	12	999	999	999			
88	-107	-2	15	999	999	999			
87	-106	-5	18	999	999	999			
86	-105	-7	22	999	999	999			
85	-103	-9	26	999	999	999			
84	-100	-10	29	999	999	999			
83	-96	-10	32	999	999	999			
82	-93	-10	35	999	999	999			
81	-90	-9	35	999	999	999			
80	-87	-8	35	999	999	999			
79	-83	-6	32	999	999	999			
78	-79	-5	28	999	999	999			
77	-75	-3	23	999	999	999			
76	-72	-2	16	999	999	999			
75	-70	-1	9	999	999	999			
74	-70	0	1	-101	999	999	-31		
73	-70	1	-6	-93	999	999	-23		
72	-71	2	-12	-84	999	999	-13		
71	-73	2	-16	-76	999	999	-3		
70	-77	1	-17	-70	999	999	7		
69	-66	0	-17	-66	999	999	0		
68	-59	0	-15	-65	999	999	-6		
67	-46	0	-17	-66	999	999	-20		
66	-38	3	-23	-66	999	999	-28		
65	-37	7	-32	-66	999	999	-29		
64	-37	11	-41	-63	999	999	-26		
63	-39	13	-48	-59	999	999	-20		
62	-39	14	-50	-53	-11	-37	-14	-25	13
61	-34	13	-49	-46	-6	-46	-12	-19	3
60	-31	10	-46	-38	0	-52	-7	-10	-6
59	-29	7	-42	-31	6	-56	-2	-1	-14
58	-29	6	-37	-25	9	-54	4	3	-17
57	-25	7	-35	-21	7	-49	4	0	-14
56	-21	9	-36	-18	0	-42	3	-9	-6
55	-13	8	-41	-16	-6	-37	-3	-14	4
54	-10	4	-47	-14	-8	-37	-4	-12	10
53	-6	-1	-50	-13	-6	-40	-7	-5	10
52	-6	-6	-51	-12	-7	-43	-6	-1	8
51	-2	-7	-48	-12	-9	-45	-10	-2	3
50	-3	-3	-44	-13	-9	-46	-10	-6	-2
49	-7	2	-42	-15	-7	-44	-8	-9	-2
48	-10	6	-42	-15	-1	-40	-5	-7	2
47	-14	6	-43	-15	5	-36	-1	-1	7
46	-23	3	-42	-16	7	-34	7	4	8
45	-34	-1	-38	-17	4	-35	17	5	3
44	-40	-6	-33	-17	-3	-35	23	3	-2
43	-46	-9	-31	-15	-8	-34	31	1	-3
42	-49	-7	-31	-17	-8	-32	32	-1	-1
41	-48	-3	-30	-20	-4	-29	28	-1	1
40	-44	0	-28	-23	-2	-27	21	-2	1
39	-44	-2	-23	-24	-6	-30	20	-4	-7
38	999	999	999	-26	-11	-25			
37	999	999	999	-29	-1	-16			
36	999	999	999	-31	9	-17			
35	999	999	999	-30	5	-23			
34	999	999	999	-32	-1	-23			
33	999	999	999	-32	-1	-24			
32	999	999	999	-35	2	-26			
31	999	999	999	-36	-2	-27			
30	999	999	999	-45	-1	-18			
29	999	999	999	-49	-3	-19			
28	999	999	999	-45	-4	-15			
27	999	999	999	-43	-2	-11			
26	999	999	999	-43	-2	-11			


TEMPERATURE
MERIDIONAL
ZONAL
ALTITUDE (KM)
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80
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65
60
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50
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35
30
25
20
-100
-50
0
(°C)
-50
0
50
MPS
-50
0
50
MPS
US - SPHERE
USSR - PROSPECTIVE
1111 GMT 8/12/77
1105 GMT 8/12/77

ALT	US - SPHERE AUG 15 1977 1942 GMT			USSR - PROSPECTIVE AUG 15 1977 1935 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TLMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
94	-81	-5	65	999	999	999			
93	-76	13	64	999	999	999			
92	-68	31	59	999	999	999			
91	-62	46	49	999	999	999			
90	-56	58	36	999	999	999			
89	-51	63	21	999	999	999			
88	-52	64	7	999	999	999			
87	-55	60	-6	999	999	999			
86	-60	53	-15	999	999	999			
85	-66	44	-21	999	999	999			
84	-73	35	-23	999	999	999			
83	-79	25	-22	999	999	999			
82	-83	17	-20	999	999	999			
81	-85	11	-16	999	999	999			
80	-87	6	-11	999	999	999			
79	-86	3	-5	999	999	999			
78	-83	2	-1	999	999	999			
77	-81	4	2	999	999	999			
76	-79	7	4	999	999	999			
75	-77	11	2	999	999	999			
74	-76	16	-2	-89	999	999	-13		
73	-75	20	-9	-83	999	999	-8		
72	-73	21	-19	-79	999	999	-6		
71	-68	19	-29	-75	999	999	-7		
70	-65	13	-39	-72	999	999	-7		
69	-62	7	-45	-68	999	999	-6		
68	-56	5	-46	-64	999	999	-8		
67	-49	5	-44	-61	999	999	-12		
66	-46	7	-40	-57	999	999	-11		
65	-44	6	-37	-53	999	999	-9		
64	-41	4	-36	-50	7	-32	-9	3	4
63	-40	3	-36	-47	9	-34	-7	6	2
62	-37	4	-38	-44	9	-36	-7	5	2
61	-36	5	-40	-40	8	-36	-4	3	4

ALT	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
60	-33	0	-39	-36	6	-36	-3	6	3
59	-28	-6	-37	-31	2	-37	-3	8	0
58	-26	-9	-33	-25	-3	-37	1	6	-4
57	-22	-5	-30	-20	-8	-38	2	-3	-8
56	-17	4	-30	-17	-10	-39	0	-14	-9
55	-16	11	-33	-17	-6	-41	-1	-17	-8
54	-15	13	-37	-16	2	-44	-1	-11	-7
53	-11	12	-39	-14	7	-46	-3	-5	-7
52	-14	12	-38	-10	9	-44	4	-3	-6
51	-8	13	-34	-10	9	-40	-2	-4	-6
50	-4	15	-33	-13	8	-35	-9	-7	-2
49	-1	15	-34	-11	8	-36	-10	-7	-2
48	3	14	-36	-7	9	-44	-10	-5	-8
47	6	12	-38	-7	8	-48	-13	-4	-10
46	4	7	-38	-6	6	-42	-10	-1	-4
45	3	1	-36	-7	3	-33	-10	2	3
44	0	-3	-32	-6	0	-29	-6	3	3
43	-9	-2	-27	-18	1	-27	-9	3	0
42	-17	2	-22	-25	7	-23	-8	5	-1
41	-20	5	-17	-24	11	-20	-4	6	-3
40	-25	7	-16	-24	10	-18	1	3	-2
39	-24	5	-17	-25	10	-19	-1	5	-2
38	-20	4	-18	-27	6	-23	-7	2	-5
37	-22	2	-18	-28	3	-25	-6	1	-7
36	-32	0	-17	-29	0	-21	3	0	-4
35	-34	-1	-15	-34	-5	-20	0	-4	-5
34	-44	1	-14	-35	-1	-14	9	-2	0
33	-33	4	-14	-37	1	-7	-4	-3	7
32	-21	5	-15	-37	3	-14	-16	-2	1
31	-22	2	-16	-40	-1	-18	-18	-3	-2
30	-33	1	-17	-44	-3	-16	-11	-4	1
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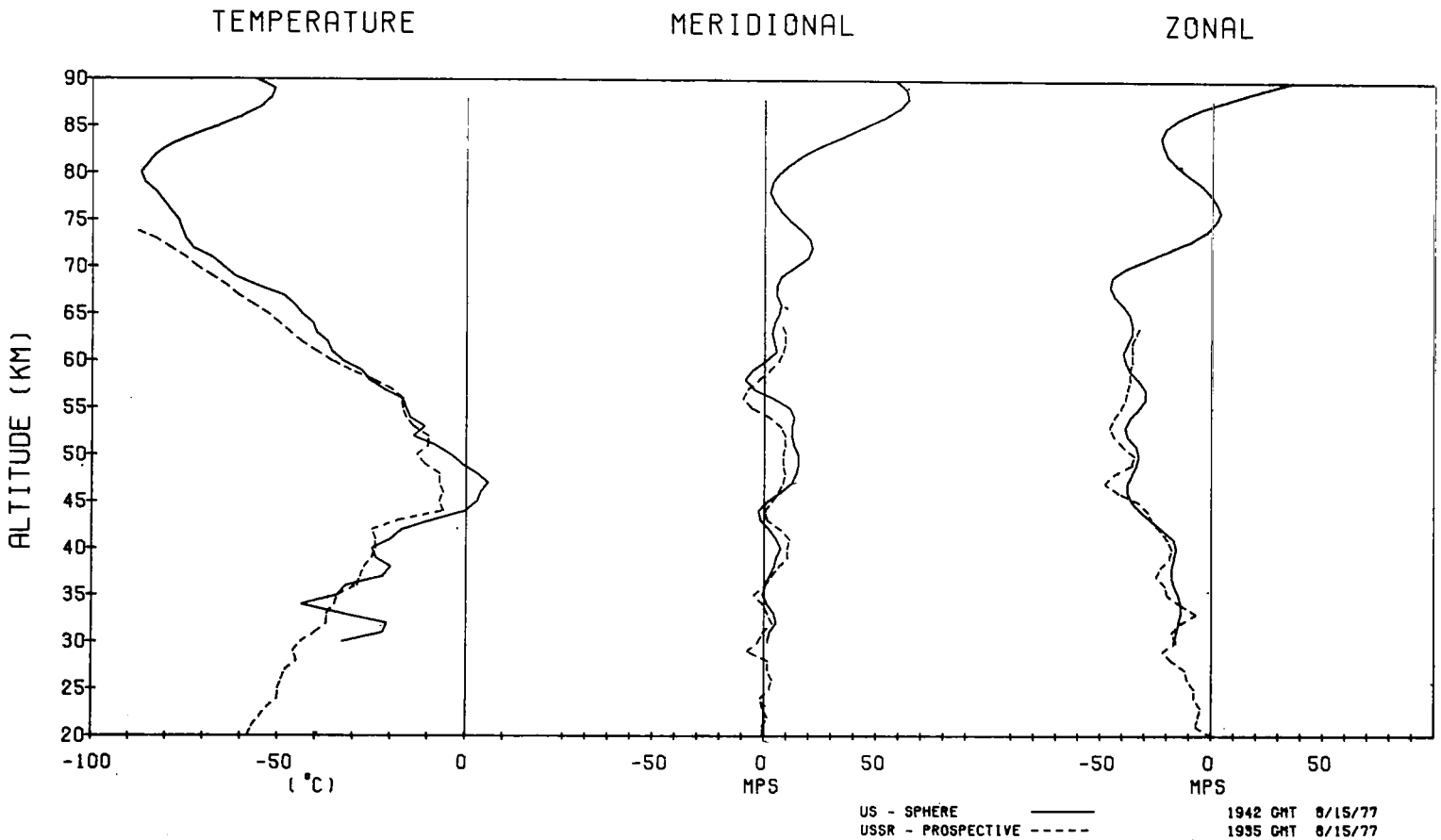
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-100
-50
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(°C)
-50
0
50
MPS
-50
0
50
MPS
US - SPHERE
USSR - PROSPECTIVE
1942 GMT 8/15/77
1935 GMT 8/15/77

ALT	US - SPHERE AUG 16 1977 0123 GMT			USSR - PROSPECTIVE AUG 16 1977 0105 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
93	-87	-71	51	999	999	999			
92	-85	-65	63	999	999	999			
91	-82	-57	74	999	999	999			
90	-78	-47	81	999	999	999			
89	-74	-35	85	999	999	999			
88	-72	-22	84	999	999	999			
87	-72	-11	79	999	999	999			
86	-72	0	72	999	999	999			
85	-73	8	64	999	999	999			
84	-76	12	55	999	999	999			
83	-80	14	46	999	999	999			
82	-82	14	38	999	999	999			
81	-84	11	31	999	999	999			
80	-86	7	25	999	999	999			
79	-85	1	20	999	999	999			
78	-83	-5	16	999	999	999			
77	-80	-11	13	999	999	999			
76	-78	-16	11	999	999	999			
75	-77	-19	10	999	999	999			
74	-75	-19	8	999	999	999			
73	-74	-17	6	999	999	999			
72	-72	-12	1	999	999	999			
71	-69	-5	-5	999	999	999			
70	-68	0	-13	999	999	999			
69	-62	0	-22	999	999	999			
68	-58	-5	-31	999	999	999			
67	-55	-11	-36	999	999	999			
66	-51	-15	-37	999	-26	-9		-11	28
65	-50	-15	-34	-60	-24	-13	-10	-9	21
64	-46	-13	-27	-52	-23	-13	-6	-10	14
63	-36	-11	-21	-45	-21	-16	-9	-10	5
62	-31	-9	-20	-40	-18	-19	-9	-9	1
61	-28	-7	-25	-35	-13	-23	-7	-6	2
60	-23	-5	-33	-30	-9	-26	-7	-4	7
59	-19	-4	-38	-23	-3	-30	-4	1	8
58	-18	-3	-40	-15	3	-35	3	6	5
57	-17	1	-38	-8	9	-40	9	8	-2
56	-12	8	-36	-4	12	-43	8	4	-7
55	-5	15	-35	-4	12	-42	1	-3	-7
54	-2	15	-35	-6	7	-36	-8	-8	-1
53	2	8	-35	-6	0	-33	-8	-8	2
52	8	-4	-36	-3	-2	-35	-11	2	1
51	8	-13	-37	1	-1	-40	-7	12	-3
50	2	-17	-36	3	0	-41	1	17	-5
49	-2	-15	-34	0	-1	-39	2	14	-5
48	-9	-11	-29	-3	-2	-35	6	9	-6
47	-11	-7	-24	-5	-5	-30	6	2	-6
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45	-8	4	-16	-9	-8	-23	-1	-12	-7
44	-8	5	-23	-8	0	-24	0	-5	-1
43	999	999	999	-9	4	-29			
42	999	999	999	-16	-2	-31			
41	999	999	999	-19	-5	-28			
40	999	999	999	-17	-7	-25			
39	999	999	999	-20	-6	-22			
38	999	999	999	-20	-3	-20			
37	999	999	999	-23	-2	-20			
36	999	999	999	-28	2	-24			
35	999	999	999	-32	3	-27			
34	999	999	999	-34	-2	-24			
33	999	999	999	-36	-10	-16			
32	999	999	999	-36	-4	-11			
31	999	999	999	-36	1	-17			
30	999	999	999	-37	-3	-17			
29	999	999	999	-40	-2	-12			
28	999	999	999	-42	4	-13			
27	999	999	999	-43	-2	-16			
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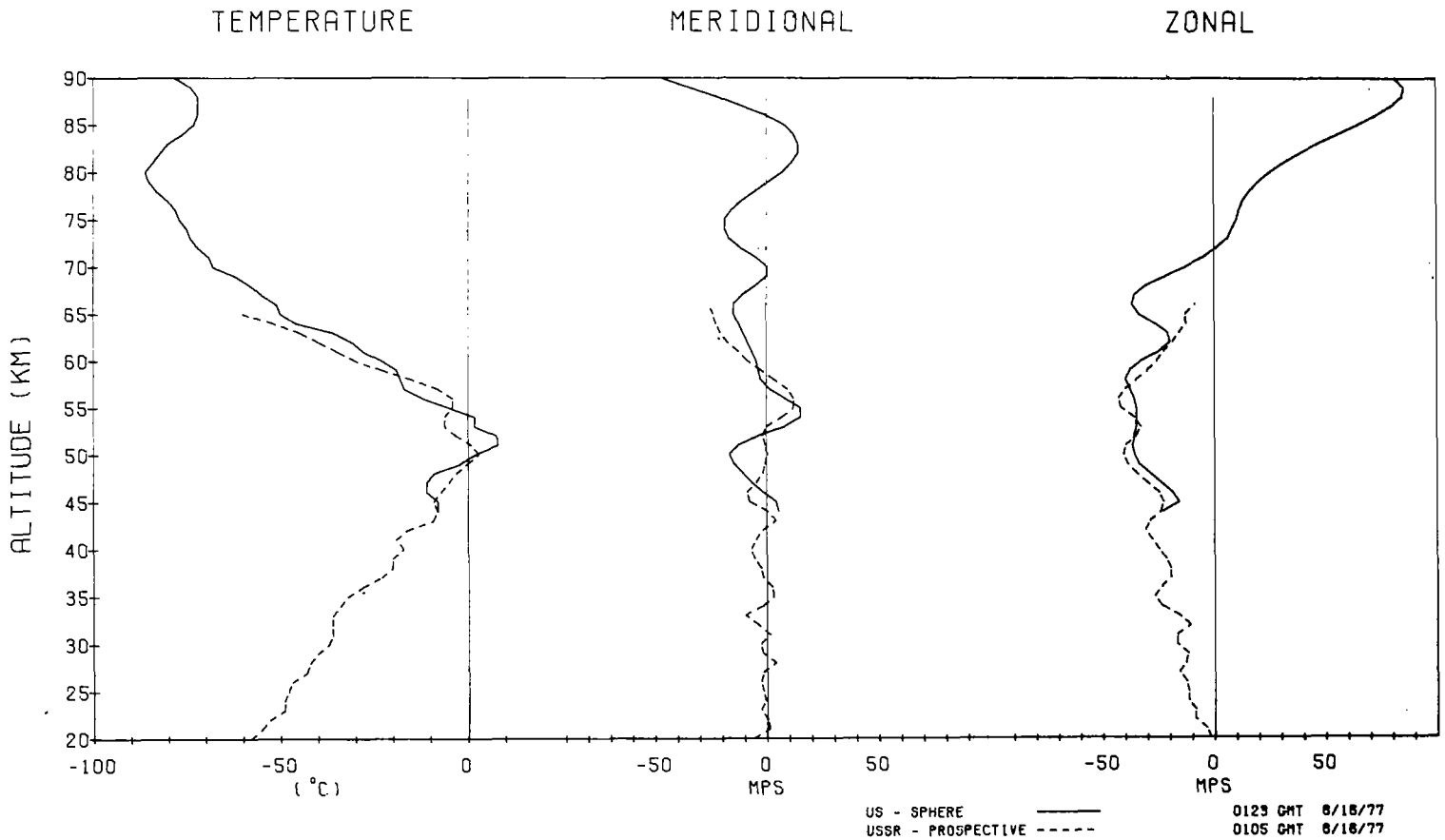
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ZONAL
ALTITUDE (KM)
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-50
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(°C)
-50
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50
MPS
-50
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MPS
US - SPHERE
USSR - PROSPECTIVE
0123 GMT 6/16/77
0105 GMT 6/16/77

ALT	US - SPHERE AUG 16 1977 2032 GMT			USSR - PROSPECTIVE AUG 16 1977 2029 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS $M\ S^{-1}$		TEMP	COMPONENT WINDS $M\ S^{-1}$		TEMP	COMPONENT WINDS $M\ S^{-1}$	
KM	DEG C	NS	EW	DEG C	NS	EW	DEG C	NS	EW
94	-86	9	-22	999	999	999			
93	-83	8	-18	999	999	999			
92	-81	7	-13	999	999	999			
91	-81	7	-6	999	999	999			
90	-85	8	2	999	999	999			
89	-88	9	9	999	999	999			
88	-91	11	15	999	999	999			
87	-94	15	19	999	999	999			
86	-96	18	22	999	999	999			
85	-96	20	23	999	999	999			
84	-93	21	22	999	999	999			
83	-90	20	20	999	999	999			
82	-86	18	16	999	999	999			
81	-81	14	12	999	999	999			
80	-78	10	8	999	999	999			
79	-75	5	4	999	999	999			
78	-72	0	0	999	999	999			
77	-71	-4	-4	999	999	999			
76	-71	-8	-7	999	999	999			
75	-72	-10	-10	999	999	999			
74	-72	-10	-13	999	999	999			
73	-70	-8	-15	999	999	999			
72	-67	-2	-18	999	999	999			
71	-64	7	-21	999	999	999			
70	-65	17	-27	999	999	999			
69	-59	23	-33	999	999	999			
68	-55	22	-38	999	999	999			
67	-48	12	-40	999	999	999			
66	-41	-3	-39	999	999	999			
65	-39	-17	-35	999	999	999			
64	-42	-27	-30	999	6	-16	33	14	
63	-46	-29	-26	999	6	-19	35	7	
62	-48	-23	-24	999	6	-20	29	4	
61	-44	-11	-25	999	5	-22	16	3	
60	-38	3	-31	999	4	-24		1	7
59	-33	13	-38	999	2	-26		-11	12
58	-32	14	-42	999	1	-28		-13	14
57	-22	11	-43	999	0	-30		-11	13
56	-15	8	-40	999	-1	-33		-9	7
55	-9	7	-37	999	-2	-36		-9	1
54	-3	5	-35	-9	-3	-37	-6	-8	-2
53	3	3	-33	-4	-4	-35	-7	-7	-2
52	1	0	-32	-5	-4	-34	-6	-4	-2
51	-1	-2	-31	-9	-3	-34	-8	-1	-3
50	-3	-1	-31	-10	-2	-35	-7	-1	-4
49	-4	1	-31	-8	1	-38	-4	0	-7
48	-6	3	-31	-9	3	-39	-3	0	-8
47	-3	3	-31	-13	5	-37	-10	2	-6
46	-6	4	-31	-14	7	-33	-8	3	-2
45	-8	5	-32	-10	7	-32	-2	2	0
44	-5	5	-32	-9	6	-33	-4	1	-1
43	0	5	-30	-10	4	-32	-10	-1	-2
42	-3	4	-26	-12	2	-28	-9	-2	-2
41	-8	4	-21	-13	2	-22	-5	-2	-1
40	-15	3	-18	-16	4	-20	-1	1	-2
39	-26	4	-18	-28	3	-21	-2	-1	-3
38	-36	4	-20	-28	4	-22	8	0	-2
37	-39	2	-21	-28	3	-25	11	1	-4
36	-30	-2	-19	-28	-5	-23	2	-3	-4
35	-26	-4	-15	-31	-10	-17	-5	-6	-2
34	-23	-4	-14	-32	-7	-13	-9	-3	1
33	-33	-2	-13	-33	-2	-12	0	0	1
32	-34	3	-14	-34	2	-15	0	-1	-1
31	-40	8	-16	-33	6	-18	7	-2	-2
30	-53	7	-17	-37	5	-22	16	-2	-5
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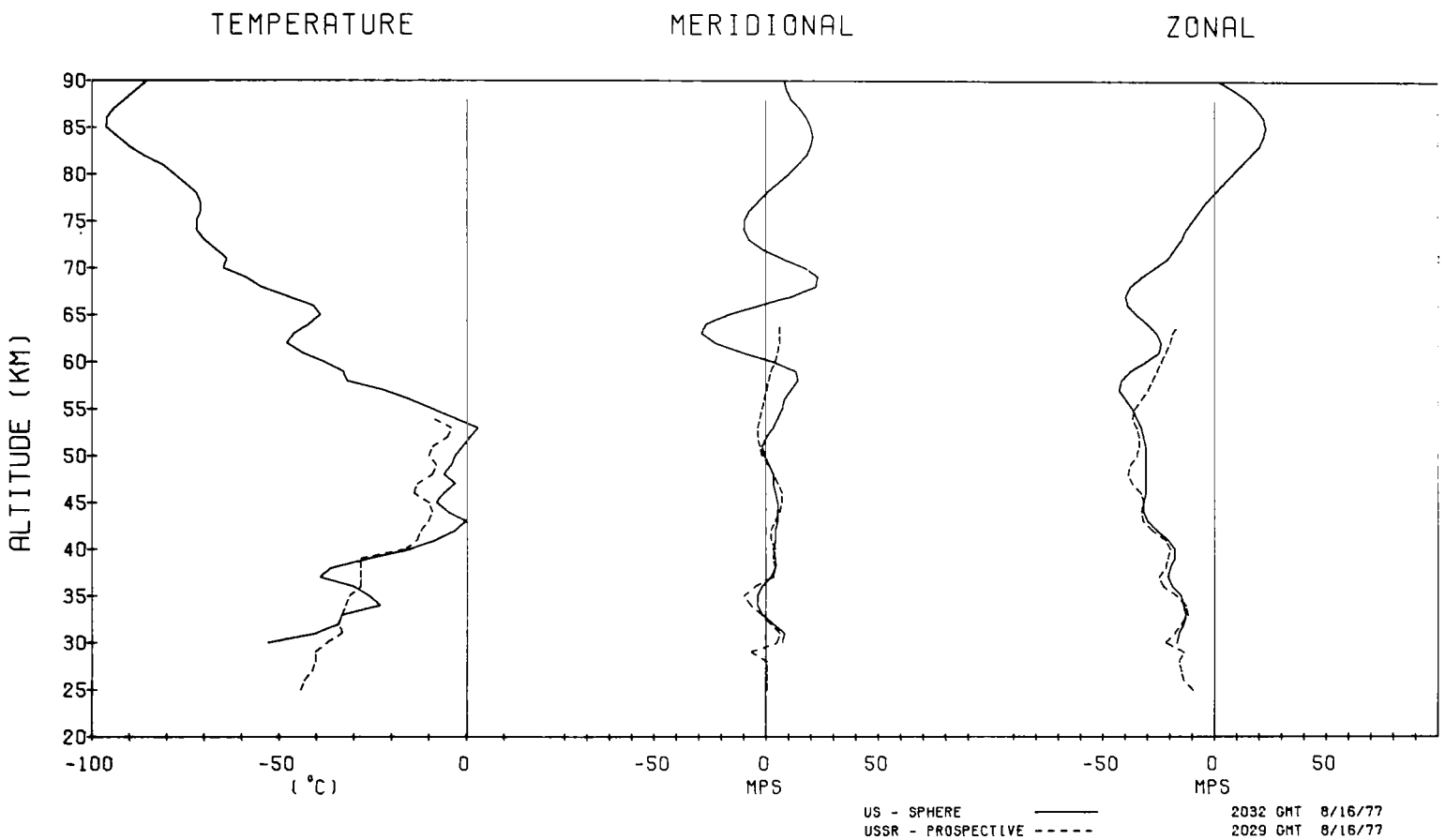
28	999	999	999	-40	0	-16			
27	999	999	999	-41	0	-15			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-100
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(°C)
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MPS
-50
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MPS
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USSR - PROSPECTIVE
2032 GMT 8/16/77
2029 GMT 8/16/77

ALT	US - SPHERE AUG 19 1977 0125 GMT			USSR - PROSPECTIVE AUG 19 1977 0120 GMT			DIFFERENCES USSR-US		
	TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1		TEMP	COMPONENT WINDS -1	
KM	DEG C	M S NS	EW	DEG C	M S NS	EW	DEG C	M S NS	EW
93	-83	-1	17	999	999	999			
92	-82	-9	33	999	999	999			
91	-81	-15	47	999	999	999			
90	-81	-17	57	999	999	999			
89	-79	-17	64	999	999	999			
88	-77	-15	66	999	999	999			
87	-76	-12	63	999	999	999			
86	-76	-7	58	999	999	999			
85	-76	-2	51	999	999	999			
84	-76	4	42	999	999	999			
83	-78	10	33	999	999	999			
82	-77	15	24	999	999	999			
81	-76	20	15	999	999	999			
80	-77	24	6	999	999	999			
79	-78	26	-3	999	999	999			
78	-80	26	-11	-88	999	999	-8		
77	-80	24	-19	-88	999	999	-8		
76	-82	21	-25	-88	999	999	-6		
75	-83	15	-31	-87	999	999	-4		
74	-85	8	-35	-86	999	999	-1		
73	-86	-1	-37	-84	999	999	2		
72	-85	-11	-37	-82	999	999	3		
71	-82	-20	-34	-81	999	999	1		
70	-82	-24	-26	-79	-28	7	3	-4	33
69	-71	-22	-14	-78	-26	5	-7	-4	19
68	-66	-12	-4	-75	-24	2	-9	-12	6
67	-57	0	-2	-72	-22	-1	-15	-22	1
66	-51	9	-10	-68	-20	-6	-17	-29	4
65	-49	9	-24	-62	-17	-10	-13	-26	14
64	-44	2	-38	-56	-15	-15	-12	-17	23
63	-40	-9	-44	-50	-13	-20	-10	-4	24
62	-35	-18	-42	-44	-12	-24	-9	6	18
61	-30	-22	-36	-39	-12	-27	-9	10	9
60	-26	-23	-31	-36	-12	-29	-10	11	2
59	-20	-21	-28	-35	-13	-29	-15	8	-1
58	-14	-17	-26	-34	-13	-29	-20	4	-3
57	-15	-13	-26	-33	-12	-30	-18	1	-4
56	-17	-11	-27	-30	-9	-33	-13	2	-6
55	-18	-10	-29	-25	-6	-34	-7	4	-5
54	-16	-7	-29	-19	-4	-34	-3	3	-5
53	-11	-1	-28	-15	-3	-31	-4	-2	-3
52	-4	4	-27	-16	-5	-24	-12	-9	3
51	-1	5	-25	-16	-6	-17	-15	-11	8
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49	-5	2	-21	-7	2	-19	-2	0	2
48	-2	1	-21	-6	8	-24	-4	7	-3
47	-5	0	-23	-10	10	-25	-5	10	-2
46	-8	-2	-26	-10	4	-25	-2	6	1
45	-11	-5	-28	-6	-5	-31	5	0	-3
44	-8	-8	-29	-8	-10	-37	0	-2	-8
43	-11	-8	-28	-12	-7	-36	-1	1	-8
42	-17	-5	-26	-22	-6	-27	-5	-1	-1
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39	-17	3	-13	-24	2	-10	-7	-1	3
38	-19	2	-13	-24	1	-12	-5	-1	1
37	-28	0	-16	-29	-1	-17	-1	-1	-1
36	-33	-3	-21	-31	-4	-21	2	-1	0
35	-35	-2	-22	-33	-2	-24	2	0	-2
34	999	999	999	-33	-2	-18			
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30	999	999	999	-44	3	-16			
29	999	999	999	-44	1	-17			
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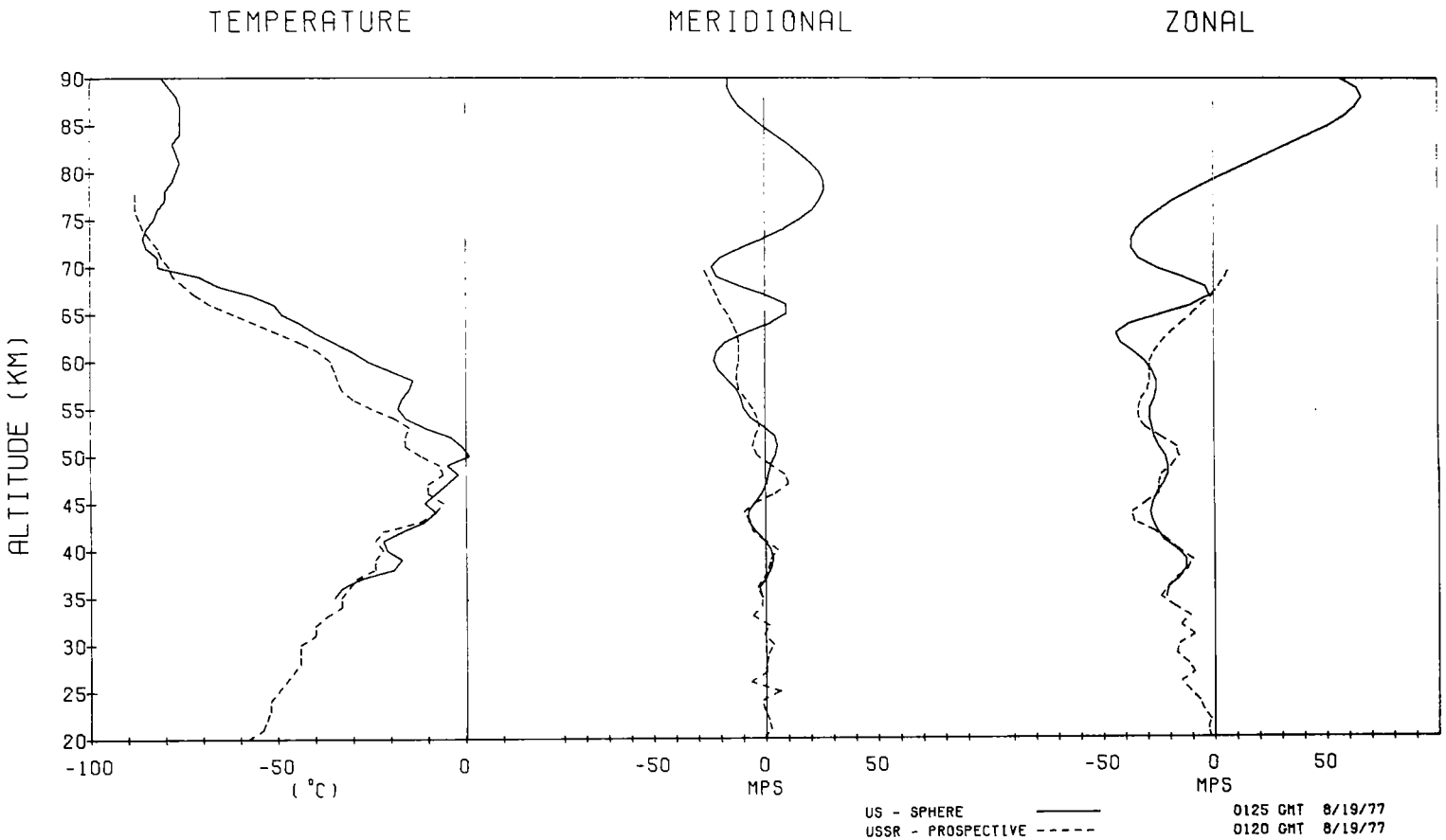
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(°C)
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50
MPS
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MPS
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USSR - PROSPECTIVE
0125 GMT 8/19/77
0120 GMT 8/19/77

	US - SPHERE AUG 19 1977 0524 GMT			USSR - PROSPECTIVE AUG 19 1977 0507 GMT			DIFFERENCES USSR-US		
ALT	TEMP	COMPONENT WINDS $M\ S^{-1}$		TEMP	COMPONENT WINDS $M\ S^{-1}$		TEMP	COMPONENT WINDS $M\ S^{-1}$	
KM	DEG C	NS	EW	DEG C	NS	EW	DEG C	NS	EW
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93	-81	20	-22	999	999	999			
92	-81	13	-27	999	999	999			
91	-82	5	-30	999	999	999			
90	-85	-4	-32	999	999	999			
89	-85	-13	-32	999	999	999			
88	-85	-19	-30	999	999	999			
87	-84	-24	-28	999	999	999			
86	-81	-26	-26	999	999	999			
85	-78	-25	-23	999	999	999			
84	-77	-23	-20	999	999	999			
83	-77	-19	-18	999	999	999			
82	-77	-14	-15	999	999	999			
81	-79	-9	-12	999	999	999			
80	-82	-3	-9	999	999	999			
79	-84	3	-7	999	999	999			
78	-83	7	-5	999	999	999			
77	-80	11	-3	999	999	999			
76	-77	12	-3	-94	999	999	-17		
75	-71	12	-4	-89	999	999	-18		
74	-67	9	-6	-82	999	999	-15		
73	-64	3	-11	-76	999	999	-12		
72	-64	-5	-18	-71	999	999	-7		
71	-67	-15	-27	-67	999	999	0		
70	-75	-25	-35	-66	999	999	9		
69	-73	-32	-41	-66	999	999	7		
68	-69	-33	-40	-67	999	999	2		
67	-65	-27	-34	-67	999	999	-2		
66	-55	-17	-28	-67	999	999	-12		
65	-51	-9	-31	-65	-27	-20	-14	-18	11
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63	-47	-12	-53	-58	-27	-35	-11	-15	18
62	-43	-17	-60	-53	-28	-41	-10	-11	19
61	-36	-17	-58	-47	-29	-45	-11	-12	13
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57	-20	-22	-36	-28	-31	-53	-8	-9	-17
56	-17	-21	-34	-25	-27	-48	-8	-6	-14
55	-14	-16	-33	-24	-19	-39	-10	-3	-6
54	-12	-11	-33	-24	-10	-31	-12	1	2
53	-9	-8	-32	-24	-4	-32	-15	4	0
52	-10	-5	-32	-20	1	-33	-10	6	-1
51	-8	-2	-33	-15	4	-36	-7	6	-3
50	-5	-2	-34	-11	3	-37	-6	5	-3
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45	-7	-3	-30	-14	-23	-22	-7	-20	8
44	-8	-3	-31	-18	-17	-27	-10	-14	4
43	-14	-5	-29	-16	-3	-34	-2	2	-5
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38	-24	-3	-17	-28	-6	-17	-4	-3	0
37	-31	0	-17	-28	0	-15	3	0	2
36	-37	3	-18	-29	10	-17	8	7	1
35	-37	5	-19	-30	11	-22	7	6	-3
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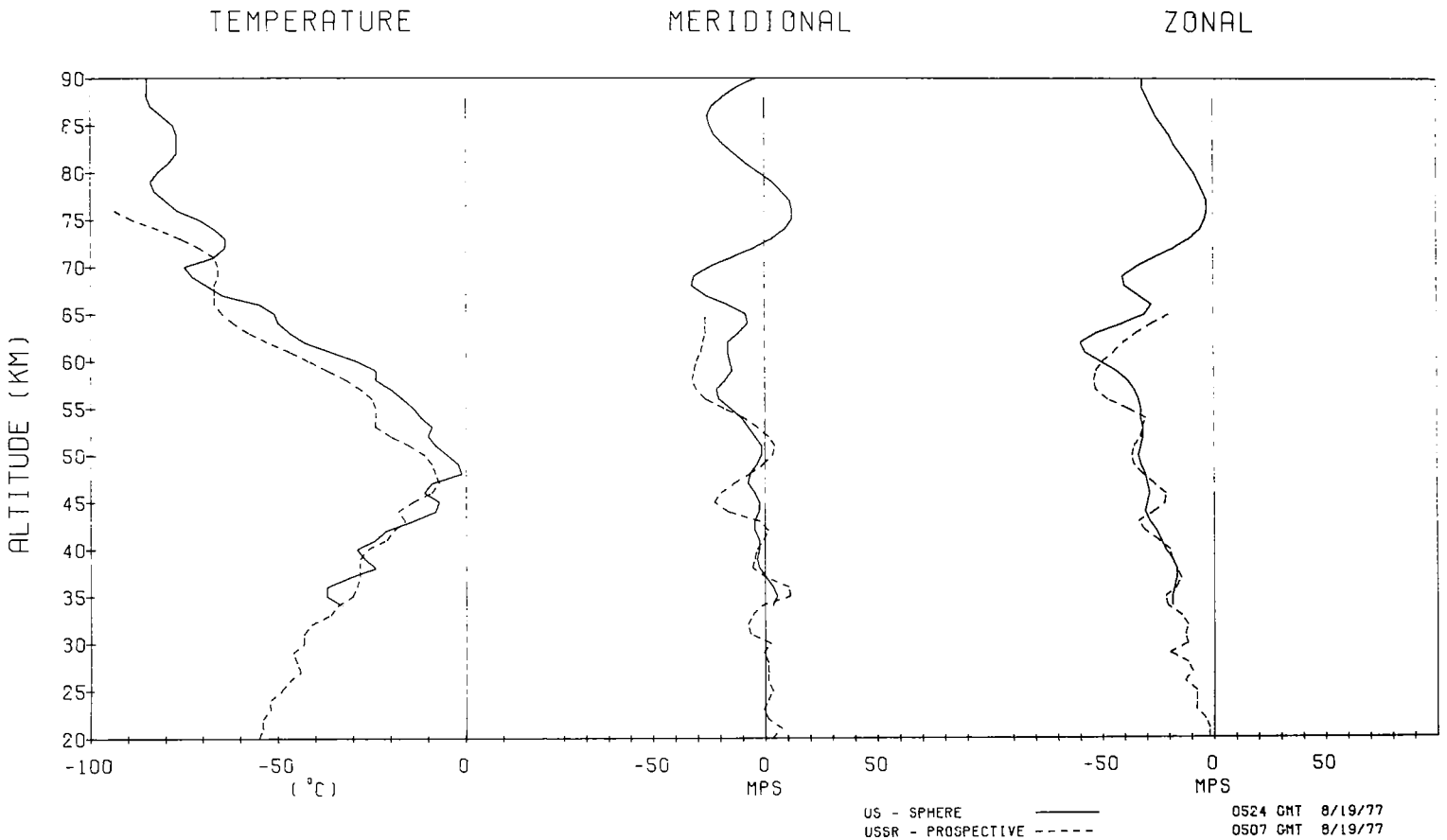
31	999	999	999	-43	-7	-13			
30	999	999	999	-43	2	-12			
29	999	999	999	-46	-1	-20			
28	999	999	999	-45	1	-12			
27	999	999	999	-44	1	-10			


TEMPERATURE
MERIDIONAL
ZONAL
ALTITUDE (KM)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
-100
-50
0
(°C)
-50
0
50
MPS
-50
0
50
MPS
US - SPHERE
USSR - PROSPECTIVE
0524 GMT 8/19/77
0507 GMT 8/19/77

APPENDIX F

LISTINGS OF US RADIOSONDE (NWS TYPE JOO5) AND USSR RADIOSONDE (TYPE RKZ) DATA

During the intercomparison exercise at Wallops Island, Va., it was recognized that much of the rocketsonde data makes use of a radiosonde profile, either, for tie-on at some initial level for computation of pressure at rocketsonde altitudes, or to provide a continuous profile from the surface to the top of the rocket data. Differences in rocketsonde temperature and geopotential heights at fixed pressure surfaces when compared to other rocketsonde measurements can be attributed to lack of suitable tie-on information. In order to provide data suitable for such an analysis, radiosondes of the US and USSR were launched on a single balloon and tracked by the ground equipment of both participants. Although analysis of the measurements still remain to be accomplished, this was, to our knowledge, the first time US and USSR instruments were used to measure the exact same volume of the atmosphere. The radiosonde instrument used during this test was the typical US National Weather Service device (JOO5) and the radiosonde used aboard the USSR Research Vessel Akademik Korolev was the RKZ instrument.

ТАЭ-2 37 45 С 75 27 3

ТАБЛИЦА РЕЗУЛЬТАТОВ ЗОНДИРОВАНИЯ

СТАНЦИЯ НИС АКАД. КОРОЛЕВ ТИП Р/З РКЗ-2 N ВЫПУСКА 73

ДАТА 24/08-77 ВРЕМЯ НАБЛ. 12,0 GMT. 06,9 МЕСТН.

М	К	ОБЛАЧНОСТЬ И АТМОСФЕРН. ЯВЛЕНИЯ													ВЫСОТА НАД ПЗ.					
		06/04 СI АС													0,1 КМ		0,2 КМ		0,5 КМ	
		КОЛИЧ		ФОРМА								ВЫСОТА			Д	V	Д	V	Д	V
		ОБ	НЖ	1	2	3	4	5	Г	Ф		УМ	ПЗ							
		06	04	1	1	0	0	0	0	0							216	10	234	10

М	ШИФР	Н	Р	Т	G	U	Д	V	D	W
		0,01	1013	22.3		91	200	09	1.5	
		0,13	1000	21.9		91			1.6	
		0,20	992	21.6		90	215	10		
3	1 НГ	0,24	986	21.5	0.32	90	219	10	1.7	
		0,31	979	21.5		90	224	11		
3	1 ВГ	0,49	959	21.7	-0.08	79	236	11	3.8	
		0,50	958	21.6		79	235	10		
		0,61	946	21.3		77	237	11		
		0,91	913	20.5		74	232	14		
		1,00	904	20.3		73	233	14		
		1,04	900	20.2		72	234	15	5.1	
3	4 НГ	1,20	884	19.9	0.26	70	231	15	5.5	
		1,50	853	17.0	0.93	67	229	16		
		1,53	850	16.8		66	229	16	6.3	
		1,59	844	16.3		66	229	16	6.4	
		2,00	804	13.0	0.81	73	228	15		
		2,04	800	12.6		74	227	15	4.5	
		3,00	713	5.8	0.72	89	232	19		252
		3,15	700	4.8		91	234	19	1.4	
3	3 НГ	3,42	677	2.6	0.75	94	237	20	0.9	
3	0 ЧГ	3,91	637	0.0		97	238	21	0.4	
		4,00	630	- 0.5		98	239	21		
3	2 ЧГ	4,15	618	- 1.4	0.54	98	239	21	0.2	
		4,33	604	- 1.3		99	240	20	0.1	
3	2 ВГ	4,39	600	- 1.3	-0.00	98	240	20	0.2	
		5,00	556	- 5.5	0.68	89	238	19		
		5,82	500	-10.0		92	230	19	1.1	
		6,00	488	-11.0	0.55	91	227	18		291
		7,00	428	-16.6	0.56	79	238	15		
		7,51	400	-19.3		71	234	1?	3.8	
3	4 НГ	7,55	398	-19.5	0.52	72	234	15	3.8	
		8,00	374	-22.6	0.69	76	236	17		
		8,49	350	-26.7		79	240	19	2.4	
		8,94	329	-30.0		65	244	19	4.4	326
		9,00	326	-30.5	0.79	65	244	19		
		9,58	300	-36.0		68	245	21	3.8	
3	3 НГ	9,62	298	-36.4	0.94	68	245	22	3.7	
		10,00	282	-38.2		72	246	23		
3	4 НГ	10,14	277	-39.0	0.49	72	246	24	3.1	
		10,83	250	-44.5		71	249	24	3.0	
		11,00	244	-45.9	0.81	71	250	24		
		12,00	209	-53.7	0.78	70	253	27		
		12,28	200	-55.8		70	252	27	2.8	
3	3 НГ	12,56	192	-57.9	0.76	70	252	26	2.8	352
3	2 НГ	13,00	178	-60.1	0.50	68	251	25	2.9	
3	2 ВГ	13,26	171	-60.1	-0,01	67	252	24	3,0	
		14,00	152	-64.3		64	253	21		
		14,07	150	-64.8		64	253	21	3,2	
5	0 НГ	14,17	148	-65.5	0.59	64	253	20	3,2	
		15,00	128	-66.2	0,09	61	248	19		
		16,00	109	-66.7	0,05	57	236	19		
		16,53	108	-66.5		56	248	15	4,0	
5	0ПМТ	16,89	94.2	-66.9	0.02	55	257	12	4.1	382
		17,00	92.5	-66.2		54	260	11		
		17,69	82.4	-61.3	-0.70	53	272	06	4,7	
		18,00	78.6	-61.8	0.17	52	259	05		
		18,72	70.0	-60.1		50	227	04	5,1	
		19,00	67.0	-59.3	-0,26	49	214	03		
5	0 ВГ	19,76	59.4	-56.7	-0.33	46	173	03	6,0	
		20,00	57.1	-57.6	0.37	45	158	04		
		20,84	50.0	-56.1		41	110	05	6,8	
		21,00	48.8	-55.5	-0,21	41	106	05		400
		22,00	41.7	-54.6	-0,08	38	085	06		
		23,00	35.7	-53.0	-0.16	38	106	07		
		23,21	34.6	-52.5	-0,25	37	113	07	7,8	
		24,00	30.6	-52.6	0,01	37	118	07		370
		24,12	30.0	-52.7		36	111	07	8,8	
		25,00	26.2	-52.3	-0,03	36	067	06		
		26,00	22.4	-50.7	-0,16		068	08		
		26,75	20.0	-50.2			088	11		
		27,00	19.2	-50.1	-0,06		095	12		
		28,00	16.5	-48.1	-0,20		091	12		415
		28,64	15.0	-47.8			089	12		
		29,00	14.2	-47.7	-0,05		089	12		
		30,00	12.2	-45.8	-0,19		094	14		
		31,00	10.5	-45.2	-0,06		096	16		
		31,33	10.0	-44.6			096	16		
		32,00	9.0	-45.1			097	18		
		32,11	8.9	-45.4	0,02		097	18		
		33,00	7.9	-42.9	-0,28		087	18		448
		34,00	6.7	-42.2	-0,07					
		34,68	6.1	-40.7	-0,23					648

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ТАБЛИЦА РЕЗУЛЬТАТОВ ЗОНДИРОВАНИЯ

СТАНЦИЯ НИС АКАД. КОРОЛЕВ ТИП Р/З РКЗ-2 N ВЫПУСКА 74

ДАТА 24/08-77 ВРЕМЯ НАБЛ. 14,9 СМТ. 00,9 МЕСТН.

М	К	ОБЛАЧНОСТЬ И АТМОСФЕРН.ЯВЛЕНИЯ:	ВЫСОТА НИЖ. ПОЛ.					
		10/10 NS,FRNB	0,1 КМ		0,2 КМ		0,5 КМ	
		КОЛИЧ: ФОРМА : ВЫСОТА	Д	V	Д	V	Д	V
		05:НЖ:1:2:3:4:5:Г*:УМ : ПЗ						
		19:10:0:0:0:0:6:0:0: :	212	14	221	15	236	16

М	ШИФР	Н	Р	Т	G	U	Д	V	D	W
		0,01	1013	21,8		92	220	11	1,4	
		0,12	1000	21,5		94	213	14	1,0	
		0,20	991	21,4		95	220	15		
		0,31	979	21,1		94	230	15		
		0,50	958	20,7	0,23	88	236	14		
		0,61	945	20,5		88	239	14		
		0,91	913	19,6		84	234	15		
		1,00	904	19,2	0,30	80	234	15		
		1,02	901	19,1		79	235	15	3,7	
		1,04	900	19,1		79	235	15	3,7	
3	4 НГ	1,22	881	18,2	0,44	82	238	15	3,2	
		1,50	853	16,0	0,82	85	231	15		
		1,53	850	15,8		86	231	15	2,4	
		2,00	804	12,1	0,77	92	228	14		
		2,04	800	11,9		92	230	14	1,2	
3	3 НГ	2,66	742	7,5	0,69	90	233	15	1,6	216
		3,00	712	5,7	0,55	92	233	14		
		3,14	700	4,9		94	233	14	0,9	
3	0 НГ	3,97	632	0,0		94	252	13	0,9	
		4,00	630	- 0,2		94	252	13		
3	1 НГ	4,08	623	- 0,6	0,58	95	250	13	0,7	
		4,26	610	- 0,4		97	247	12	0,4	
3	1 ВГ	4,33	604	- 0,4	-0,09	97	246	12	0,5	
		4,39	600	- 0,8		96	246	12	0,5	
		5,00	556	- 4,9		95	242	14		233
3	3 НГ	5,13	546	- 5,7	0,66	94	242	14	0,8	
		5,82	500	- 8,3		92	247	14	1,1	
		6,00	489	- 8,8	0,36	92	247	14		
3	4 НГ	6,52	457	-11,6	0,52	92	247	15	1,0	
		7,00	429	-14,5	0,62	92	248	15		248
		7,53	400	-17,9		90	247	16	1,2	
		8,00	375	-21,1	0,65	88	243	19		
		8,51	350	-24,0		86	240	21	1,6	
		9,00	327	-27,5	0,64	84	239	23		
3	4 НГ	9,43	308	-30,2	0,63	82	235	23	2,0	
		9,62	300	-31,8		81	236	23	2,1	
		10,00	284	-34,6	0,78	79	237	22		264
3	4 НГ	10,73	256	-39,3	0,64	75	240	24	2,6	
		10,88	250	-40,9		75	240	25	2,6	
		11,00	246	-42,2	1,07	75	240	25		
		12,00	211	-52,4	1,02	73	240	27		
		12,35	200	-55,6		72	240	28	2,5	
3	2 НГ	12,62	192	-58,1	0,91	72	240	28	2,5	269
3	2 ВГ	12,97	181	-58,1	0,01	71	242	28	2,6	
		13,00	180	-58,2		71	242	28		

М	ШИФР	Н	Р	Т	G	U	Д	V	D	W
3	4 НГ	13,49	167	-59,5	0,26	78	242	27	2,7	
		14,00	154	-63,5		78	239	22		
5	0 НГ	14,06	152	-63,9	0,79	78	238	22	2,6	
		14,15	150	-63,5		69	238	21	2,6	
		15,00	131	-61,7		69	240	19		
		15,07	129	-61,6	-0,23	69	240	19	2,8	
5	0ПМТ	15,61	119	-64,3	0,50	68	245	19	2,7	276
		16,00	111	-63,2	-0,28	68	253	17		
		16,64	100	-61,5		68	269	12	2,9	
		16,86	96,6	-61,5	-0,20	67	270	11	2,9	
		17,00	94,4	-60,3		67	262	11		
5	0 ВГ	17,27	90,4	-58,0	-0,87	67	246	11	3,1	
		18,00	80,5	-57,6	-0,06	66	208	11		288
		18,89	70,0	-56,0		66	201	05	3,3	
		19,00	68,9	-55,5	-0,20	66	200	05		
		19,32	65,5	-53,3	-0,70	65	194	04	3,4	
		20,00	58,9	-54,3	0,15	64	164	05		
		20,89	51,3	-53,8	-0,06	63	135	06	3,7	
		21,00	50,4	-53,3		63	130	06		
		21,05	50,0	-53,2		63	129	06	3,8	
		22,00	43,0	-51,9	-0,17	61	108	04		336
		22,85	37,8	-49,7	-0,26	60	099	04	4,3	
		23,00	37,0	-50,6		60	098	04		
		24,00	31,7	-51,1			092	04		
		24,09	31,2	-51,0	0,11		091	04		
		24,37	30,0	-50,1			091	05		
		25,00	27,0	-48,0			093	06		
		25,11	26,6	-47,6	-0,33		094	07		
		26,00	23,4	-47,9	0,03		096	09		
		27,00	20,1	-47,8	-0,01		098	10		490
		27,04	20,0	-47,7			098	11		
		28,00	17,3	-46,3	-0,14		100	11		
		28,32	16,5	-46,3	-0,00					
		28,93	15,0	-43,3	-0,50					489

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ТАБЛИЦА РЕЗУЛЬТАТОВ ЗОНДИРОВАНИЯ

СТАНЦИЯ НИС АКАД. КОРОЛЕВ ТИП Р/З РКЗ-2 N ВЫПУСКА 75

ДАТА 24/08-77 ВРЕМЯ НАБЛ. 23,2 GMT. 13,2 МЕСТН.

М	К	ОБЛАЧНОСТЬ И АТМОСФЕРН. ЯВЛЕНИЯ				ВЫСОТА Н.Д ПЗ.					
		10/00 АС				0.1 КМ		0.2 КМ		0.5 КМ	
		КОЛИЧ		ФОРМА	ВЫСОТА	Д	V	Д	V	Д	V
		ОБ	НЖ	1:2:3:4:5:Г:Ф	УМ : ПЗ						
		10	00	8:1:0:0:0:0:0		332	07	324	07	238	05

М	ШИФР	H	P	T	G	U	Д	V	D	W
		0.01	1010	23.1		88	320	05	2.1	
		0.10	1000	22.9		89	333	07	1.8	
		0.20	989	22.6		91	325	07		
		0.31	976	22.3		93	310	05		
		0.50	955	21.0	0.43	98	244	05		
		0.61	943	20.2		99	234	07		
		0.91	911	18.6		98	214	10		
		1.00	901	18.4	0.52	98	214	11		
		1.01	900	18.4		98	214	11	0.3	
3	4 НГ	1.36	864	17.1	0.34	97	216	10	0.5	
		1.50	850	16.2		96	213	11		
		2.00	802	13.4	0.58	90	212	12		
		2.02	800	13.3		90	212	12	1.6	
3	1 НГ	2.62	745	9.4	0.64	94	211	14	0.8	
3	1 ВГ	2.77	732	9.8	-0.28	95	210	15	0.7	
		3.00	711	8.2	0.70	97	205	16		281
		3.13	700	7.3		98	207	17	0.3	
3	5 НГ	3.45	673	4.6		100	203	17	0.0	
3	5 ВГ	3.90	637	1.2		100	204	18	0.0	
		4.00	629	0.3	0.79	97	206	18		
3	0 НГ	4.03	627	0.0		96	207	18	0.6	
3	2 НГ	4.30	606	- 2.1	0.81	86	214	19	2.0	
		4.38	600	- 2.1		83	215	19	2.4	
		4.39	599	- 2.1		83	216	19	2.5	
3	2 ВГ	4.66	579	- 2.1	0.00	92	221	19	1.2	
3	5 НГ	4.92	561	- 3.4		100	227	19	0.0	
		5.00	555	- 3.6		100	228	19		
3	4 НГ	5.17	543	- 4.0	0.37	100	229	19	0.0	
		5.82	500	- 7.9		100	231	17	0.0	
		6.00	488	- 9.0	0.60	100	231	19		311
3	5 ВГ	6.53	456	-11.8		100	230	19	0.0	
		7.00	429	-14.7	0.58	97	227	22		
		7.52	400	-18.3		93	228	23	0.8	
3	4 НГ	7.70	390	-18.9	0.60	94	229	23	0.7	
		8.00	375	-21.7	0.93	94	233	24		
		8.51	350	-24.8		96	237	24	0.5	
		9.00	327	-28.5		94	237	25		
3	4 НГ	9.20	318	-30.0	0.69	92	240	25	0.8	
		9.61	300	-33.7		89	243	25	1.2	
		10.00	284	-37.9	0.99	82	241	27		326
		10.85	250	-45.8		82	241	29	1.7	
		11.00	244	-46.9	0.90	82	240	29		
		12.00	210	-55.4		76	232	31		
3	3 НГ	12.08	207	-56.1	0.85	76	231	31	2.2	
		12.30	200	-57.1		75	229	30	2.3	

М	ШИФР	H	P	T	G	U	Д	V	D	W
		13.00	179	-61.2	0.55	71	234	32		349
3	3 НГ	13.22	172	-62.3	0.48	70	235	33	2.6	
3	4 НГ	13.59	162	-62.5	0.06	68	240	32	2.9	
		14.00	152	-65.5		66	246	29		
5	0 НГ	14.02	152	-65.7	0.74	66	247	29	2.9	
		14.08	150	-65.6		66	248	29	3.0	
		14.56	139	-64.6	-0.20	65	255	26	3.1	
		14.74	134	-62.1	-1.36	64	256	24	3.2	
		15.00	129	-63.5	0.54	63	257	22		
		16.00	110	-64.3	0.08	64	259	13		305
		16.30	104	-66.2	0.62	64	258	11	3.1	
		16.56	100	-64.6		65	256	09	3.1	
		17.00	93.0	-61.2		65	253	09		
		17.01	92.0	-61.1	-0.72	65	253	09	3.2	
5	0ПМТ	17.87	80.7	-66.4	0.61	63	249	12	3.2	
		18.00	79.0	-64.7		53	253	11		
5	0 ВГ	18.37	74.5	-59.4	-1.42	62	265	07	3.6	252
		18.76	70.0	-59.1		56	273	04	3.8	
		19.00	67.7	-58.2	-0.20	59	262	03		
		19.58	61.4	-58.3	0.03		238	02		
		20.00					265	02		
		21.00					000	02		209
		22.00					049	02		
		23.00					065	05		265
		24.00					088	10		
		25.00					112	09		
		26.00					083	08		243

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ТАБЛИЦА РЕЗУЛЬТАТОВ ЗОНДИРОВАНИЯ

СТАНЦИЯ НИС АКАД. КОРОЛЕВ ТИП Р/З РКЗ-2 N ВЫПУСКА 76

ДАТА 25/08-77 ВРЕМЯ НАБЛ. 11,5 GMT. 06,5 МЕСТН.

М	К	ОБЛАЧНОСТЬ И АТМОСФЕРН. ЯВЛЕНИЯ: 00/00										ВЫСОТА НАД ПЗ. 0.1 КМ		0.2 КМ		0.5 КМ	
		КОЛИЧ:		ФОРМА:							ВЫСОТА	Д	V	Д	V	Д	V
		ОБ	НЖ	1	2	3	4	5	Г	Ф	ЧМ : ПЗ						
		00	00	9	9	9	9	9	0	0	'	351	11	355	09	163	78

М	ШИФР	H	P	T	G	U	Д	V	D	W
		0,01	1018	16,2		91	360	09	1.5	
		0,17	1000	14,8		86	353	10	2.2	
		0,20	996	14,4		85	355	09		
		0,31	983	13,4		82	007	10		
		0,50	961	12,6		77	190	75		
3	1 НГ	0,56	955	12,6	0,67	75	103	85	4.3	
		0,61	948	12,8		73	029	95		
		0,91	915	13,5		71	343	08		
3	1 ВГ	0,95	911	13,5	-0.24	71	338	09	5.1	
		1,00	906	13,1		71	338	09		
		1,05	900	12,7		71	339	10	5.0	
3	1 НГ	1,19	886	11,8	0.73	71	339	12	5.0	
		1,34	869	12,8		56	332	12	8.4	
3	1 ВГ	1,42	861	13,3	-0.65	57	328	12	8.3	
		1,50	854	12,8		58	324	11		
		1,53	850	12,5		58	324	11	8.1	
		2,00	804	9,8		61	308	12		
		2,04	800	9,6		62	307	12	7.0	
3	1 НГ	2,10	794	9,3	0.58	62	305	12	6.8	
3	1 ВГ	2,44	763	9,4	-0.02	65	294	12	6.3	
		2,55	753	8,8		66	289	12	6.1	
3	1 НГ	2,85	725	7,4	0.48	46	296	12	10.9	270
		3,00	713	7,8		36	300	13	14.0	
3	1 ВГ	3,11	703	8,2	-0.34	35	299	13	14.2	
		3,14	700	8,1		36	299	13	14.3	
		4,00	630	4,2	0.45	31	292	15		
		4,05	627	4,1		31	292	15	15.6	
3	1 НГ	4,22	614	3,7	0.26	31	289	15	15.5	
3	1 ВГ	4,39	601	3,7	-0.04	31	284	14	15.5	
		4,40	600	3,6		31	283	14	15.5	
3	0 НГ	4,83	569	0,0		34	278	13	14.1	
		5,00	557	- 1,6	0.88	35	284	13		
3	1 НГ	5,48	524	- 4,7	0.66	34	296	13	13.5	
3	1 ВГ	5,63	514	- 4,2	-0.34	33	295	14	13.9	
		5,85	500	- 5,9		31	294	14	14.2	
		6,00	491	- 7,1	0.79	31	292	14		291
		7,00	431	-15,1	0.80	30	285	14		
		7,55	400	-19,8		30	285	14	13.0	
		8,00	376	-23,6	0.85	30	283	14		
		8,53	350	-28,1		30	276	16	12.2	
		9,00	327	-32,0	0.83	30	265	16		300
		9,61	300	-36,4		29	267	16	11.3	
3	4 НГ	9,80	292	-37,8	0.72	30	263	16	11.1	
		10,00	284	-39,8		30	258	17		
3	3 НГ	10,66	257	-46,9	1.07	30	267	15	10.0	

М	ШИФР	H	P	T	G	U	Д	V	D	W
		10,84	250	-48,3		30	271	15	9,8	
		11,00	244	-49,4	0,72	30	269	15		
3	3 НГ	11,46	220	-53,3	0,84	31	264	16	9,2	
		12,00	209	-55,1		31	257	20		316
3	4 НГ	12,12	205	-55,3	0,31	31	255	21	8,9	
		12,28	200	-57,4		32	253	22	8,6	
3	1 ЧГ	12,72	186	-59,6	0,71	32	254	23	8,3	
3	1 ВГ	12,96	180	-58,7	-0,40	32	256	22	8,4	
		13,00	178	-58,8		32	257	22		
		14,00	152	-62,0		32	260	21		
		14,08	150	-62,4		32	266	21	8,0	
5	0 НГ	14,15	148	-62,9	0,35	32	266	21	7,9	
		14,39	143	-68,4	-1,06	32	267	21	8,2	
		15,00	129	-62,7	0,39	32	268	20		
		16,00	119	-63,2	0,04	32	275	18		341
		16,57	109	-64,5		32	279	16	7,8	
5	ОПМТ	16,67	98,5	-64,5	0,20	32	277	15	7,8	
		17,00	93,3	-61,3	-0,97	33	269	12		
5	0 ВГ	17,67	83,0	-57,2	-0,61	33	254	06	8,4	
		18,00	79,6	-58,9	0,51	33	249	04		
		18,80	70,0	-60,1		33	265	04	8,1	
		18,99	67,9	-60,6	0,17	33	268	04	8,0	344
		19,00	67,8	-60,4		33	269	04		
		19,38	63,8	-57,4	-0,79	33	279	04	8,3	
		20,00	57,8	-57,5	0,00	33	342	04		
		20,92	50,0	-55,9		33	065	06	8,5	
		21,00	49,4	-55,8	-0,17	33	067	04		
		21,75	43,9	-52,9	-0,38	33	089	05	8,7	
		22,00	42,2	-52,9	-0,03	33	096	06		
		23,00	36,2	-52,3	-0,05		085	05		366
		24,00	31,0	-51,4	-0,09		063	05		
		24,22	30,0	-51,3			066	05		
		25,00	26,6	-51,8	-0,04		078	07		
		26,00	22,9	-48,9	-0,21		086	09		
		26,39	21,5	-50,1	0,30		088	10		401
		26,86	20,0	-49,0			090	11		
		27,00	19,6	-48,7	-0,23		090	12		
		27,44	18,3	-46,9	-0,40		091	13		
		28,00	16,8	-46,8	-0,03		091	13		
		28,77	15,0	-45,9			090	14		
		29,00	14,5	-46,0	-0,08		090	15		
		30,00	12,5	-45,8	-0,01		089	16		
		31,00	10,7	-45,2	-0,07		088	17		
		31,47	10,0	-44,5			086	18		
		32,00	9,2	-45,2	0,00		084	19		473
		33,00	8,0	-43,5	-0,17					
		33,53	7,4	-43,2	-0,06					500

ТАЭ-3 37 45 С 75 27 3

ТАБЛИЦА РЕЗУЛЬТАТОВ ЗОНДИРОВАНИЯ

СТАНЦИЯ НИС АКАД. КОРОЛЕВ ТИП Р/З РКЗ-2 N ВЫПУСКА 77

ДАТА 25/08-77 ВРЕМЯ НАБЛ. 14,8 GМТ. 09,7 МЕСТН.

М	К	ОБЛАЧНОСТЬ И АТМОСФЕРН. ЯВЛЕНИЯ:									ВЫСОТА НАД ПЗ.					
	22/00 СТ АС										0.1 КМ		0.2 КМ		0.5 КМ	
	КОЛИЧ		ФОРМА						ВЫСОТА		Д	V	Д	V	Д	V
	ОБ	НЖ	1	2	3	4	5	Г	Ф	УП	ПЗ					
	02	00	1	1	0	0	0	0	0			356	08	001	09	020	06

М	ШИФР	H	P	T	G	U	Д	V	D	W
		0.01	1021	17.0		72	360	06	5.1	
		0.19	1000	15.4		74	360	09	4.5	
		0.20	998	15.3		75	000	09		
		0.31	985	14.2		76	006	09		
		0.50	964	12.6		79	019	06		
3	1 НГ	0.62	950	11.7	0.87	80	023	06	3.3	
		0.74	936	11.9		82	008	04	3.7	
		0.91	917	12.1		73	355	05		
3	1 ВГ	0.94	914	12.2	-0.13	71	354	05	5.1	
		1.00	908	12.0		68	353	05		
		1.07	900	11.9		64	352	06	6.6	
		1.50	855	10.5		41	003	07		
		1.55	850	10.4		38	002	09	13.6	
3	1 НГ	1.57	848	10.3	0.30	37	001	09	14.0	
3	1 ВГ	1.65	839	11.7	-1.77	32	358	09	15.9	
		1.84	820	11.2		22	346	09	20.7	
		2.00	805	10.7	0.30	21	336	10		
		2.05	800	10.5		21	332	10	21.3	
		2.50	758	8.9		18	318	14	22.6	
3	1 НГ	2.64	745	8.0	0.42	19	313	13	22.2	
3	1 ВГ	2.84	728	9.1	-0.57	19	305	12	22.1	265
		3.00	714	8.9		20	301	11		
3	4 НГ	3.09	706	8.8	0.10	20	301	11	21.9	
		3.16	700	8.5		20	301	11	21.6	
		4.00	632	3.2	0.62	23	300	13		
		4.41	600	1.6		25	292	13	17.9	
3	0 ЧГ	4.72	577	0.0		26	284	13	17.3	
		5.00	558	- 1.9	0.52	25	286	13		
3	2 НГ	5.48	525	- 4.6	0.56	25	287	12	17.1	
3	2 ВГ	5.70	511	- 4.7	0.00	24	286	13	17.3	296
		5.86	500	- 5.9		24	285	13	17.2	
		6.00	491	- 6.9	0.74	24	285	13		
		7.00	431	-15.4	0.85	22	279	12		
		7.56	400	-19.9		22	274	14	16.3	
		8.00	377	-23.5	0.80	22	272	15		
		8.53	350	-28.1		22	271	16	15.0	
		9.00	328	-32.2	0.87	22	268	16		317
		9.62	300	-36.9		22	267	17	13.6	
		10.00	284	-40.3	0.81	23	269	17		
		10.85	250	-47.6		23	275	17	11.9	
		11.00	244	-48.9	0.85	24	270	19		
3	3 ЧГ	11.42	229	-52.3	0.83	24	272	20	11.2	
		12.00	209	-55.1	0.48	24	267	21		
		12.29	200	-55.4		24	266	21	10.6	
3	2 НГ	12.82	184	-58.6	0.42	25	264	22	10.2	327
		13.00	179	-58.6		25	264	21		
3	2 ВГ	13.02	179	-58.6	0.01	25	264	21	10.2	
3	3 НГ	13.54	164	-61.8	0.61	25	264	20	9.8	
		14.00	152	-62.9	0.24	25	265	19		
		14.09	150	-63.2		25	265	19	9.6	
5	0 НГ	14.28	145	-63.8	0.34	25	265	18	9.5	
		15.00	129	-63.6	-0.03	25	269	17		
5	0 ПМТ	15.82	113	-64.7	0.14	24	273	15	9.6	352
		16.00	110	-64.2		24	274	14		
		16.57	100	-64.3		24	278	12	9.8	
		16.78	96.6	-64.7	-0.00	24	279	10	9.8	
		17.00	93.2	-64.2	-0.21	24	280	10		
		17.54	85.5	-59.8	-0.83	24	281	08	10.4	
		18.00	79.3	-61.8	0.43	24	282	07		
		18.34	75.0	-62.3	0.14	24	282	06	10.1	
		18.78	70.0	-58.3		24	280	06	10.5	
		19.00	67.4	-56.9		24	258	05		
5	0 ВГ	19.11	66.4	-56.2	-0.79	24	246	05	10.7	
		20.00	57.7	-57.5	0.15	24	157	03		396
		20.91	50.0	-56.7		23	114	02	10.8	
		20.93	49.8	-56.8	-0.08	23	114	02	10.8	
		21.00	49.3	-56.3		23	113	02		
		21.29	47.1	-54.2	-0.71		109	03		
		22.00	42.1	-55.0	0.12		100	03		
		22.32	40.1	-55.1	0.02		094	04		
		23.00	36.0	-52.9	-0.33		081	06		
		23.46	33.4	-51.2	-0.35		072	07		
		24.00					073	07		411
		25.00					089	08		
		26.00					094	10		
		27.00					091	12		
		28.00					089	13		
		29.00					088	14		443
		30.00					091	14		422

ТАЭ-2 37 45 С 75 27 З

ТАБЛИЦА РЕЗУЛЬТАТОВ ЗОНДИРОВАНИЯ

СТАНЦИЯ НИС АКАД. КОРОЛЕВ ТИП Р/З РКЗ-2 N ВЫПУСКА 78

ДАТА 25/08-77 ВРЕМЯ НАБЛ. 23,7 СМТ. 13,6 МЕСТН.

К	ОБЛАЧНОСТЬ И АТМОСФЕРН. ЯВЛЕНИЯ				ВЫСОТА НАД ПЗ.					
	01/00 Ac				0.1 КМ		0.2 КМ		0.5 КМ	
	КОЛИЧ: 05	ФОРМА: НЖ:1:2:3:4:5:Г:Ф	ВЫСОТА: УН	ПЗ	Д	V	Д	V	Д	V
	01:00	0:1:0:0:0:0:0			082	07	080	06	007	03

ШИФР	H	P	T	G	U	Д	V	D	W
	0.01	1021	19.3		68	070	04	6.0	
	0.19	1000	18.2		45	081	06	12.1	
	0.20	999	18.1		44	081	06		
2 НГ	0.26	992	17.7	0.62	36	072	04	15.4	
	0.31	986	17.7		29	064	04		
	0.37	979	17.7		22	048	03	21.9	
2 ВГ	0.40	976	17.7	0.00	27	039	01	19.2	
	0.50	964	16.9		46	009	03		
	0.59	956	16.4		60	358	03	7.7	
	0.61	952	15.1		59	360	04		
	0.91	919	13.8		49	348	04		
	1.00	909	13.2		46	359	04		
	1.08	900	12.6		43	010	04	12.1	
1 НГ	1.13	895	12.3	0.75	42	012	04	12.6	
1 ВГ	1.30	877	13.5	-0.72	36	097	03	14.7	
	1.50	856	12.2		30	110	03		
	1.56	850	11.7		27	102	02	18.1	
	2.00	807	10.3		13	297	02		
1 ЧГ	2.02	805	10.2	0.47	12	299	03	27.9	
	2.07	800	10.3		11	302	03	28.7	
	2.28	780	10.8		8	297	05	33.3	
1 ВГ	2.54	756	11.5	-0.26	10	294	05	30.1	
2 НГ	2.67	744	11.1	0.36	12	301	05	28.6	252
2 ВГ	2.80	732	11.0	0.00	13	308	05	[illegible]7.3	
	3.00	715	10.4		15	295	05		
	3.18	700	9.6		17	282	04	24.0	
4 НГ	3.34	687	8.9	0.42	18	271	04	22.7	
3 НГ	3.80	649	5.0	0.82	22	313	05	19.7	
	4.00	633	4.4		24	320	06		
	4.44	600	2.9		28	315	09	16.6	
4 НГ	4.68	582	1.9	0.36	30	309	09	15.6	
0 НГ	4.90	567	0.0		31	303	10	15.0	
	5.00	560	-0.9	0.87	32	300	10		
	5.89	500	-7.7		35	312	12	12.7	
	6.00	493	-8.5	0.76	36	314	12		276
	6.62	455	-12.8		42	317	14	10.2	
	7.00	432	-15.3	0.68	42	317	15		
	7.58	400	-19.0		33	319	16	12.1	
4 НГ	7.92	382	-21.6	0.68	32	321	17	12.3	
	8.00	378	-22.3		31	321	10		
	8.56	350	-26.8		29	319	12	12.6	
	9.00	329	-30.8	0.85	28	324	16		297
	9.65	300	-36.4		28	329	15	11.8	
	10.00	285	-39.6	0.87	28	325	14		
3 НГ	10.61	260	-43.9	0.87	28	314	10	10.8	

M	ШИФР	H	P	T	G	U	Д	V	D	W
		10.88	250	-46.5		28	303	20	10.6	
		11.00	246	-47.2	0.57	28	298	20		
		12.00	211	-54.6	0.74	29	300	15		307
3	1 НГ	12.30	201	-56.3	0.56	30	304	14	9.0	
		12.33	200	-56.2		30	306	14	9.0	
3	1 ВГ	12.45	194	-55.7	-0.41	31	309	14	9.0	
3	4 НГ	12.99	180	-59.1	0.63	32	318	12	8.4	
		13.00	180	-59.2		32	319	12		
3	1 НГ	13.78	159	-67.2	1.02	33	306	15	7.5	
		14.00	153	-65.7		32	300	17		
3	1 ВГ	14.02	150	-65.5	-0.70	32	300	17	7.8	
		14.11	150	-66.2		31	298	17	7.9	
5	0 НГ, ПЧТ	14.48	141	-69.0	0.75	30	294	19	8.0	299
		14.84	133	-68.7	-0.08	28	300	19	8.4	
		15.00	120	-65.9		27	302	19		
		15.23	125	-62.8	-1.56	26	305	20	9.4	
		16.00	110	-63.6	0.11	24	312	17		
		16.58	100	-65.4		31	316	15	9.0	
		16.59	99.8	-65.4	0.31	31	316	15	8.0	
		17.00	93.7	-63.8	-0.40	31	311	12		
5	0 ВГ	17.44	86.0	-61.1	-0.60	30	304	10	8.5	291
		18.00	79.7	-64.5	0.61	30	300	06		
		18.29	75.6	-64.4	-0.05	30	305	05	8.3	
		18.57	72.0	-63.5	-0.32	30	310	04	8.4	
		18.77	70.0	-59.2		30	315	03	8.8	
		19.00	67.5	-57.1		30	317	02		
		19.03	67.1	-56.9	-1.42	30	318	02	9.1	
		19.75	59.0	-59.5	0.36	28	318	03	9.1	
		20.00	57.5	-57.0	-1.00	28	318	04		
		20.89	50.0	-55.6		26	004	04	10.0	
		21.00	49.0	-55.3		26	012	04		301
		21.10	48.4	-55.1	-0.18		019	04		
		22.00	42.0	-56.1	0.11		052	05		
		23.00	35.0	-56.7			062	06		
		23.04	35.7	-56.8	0.07		062	06		
		23.30	34.7	-53.4	-1.31		062	07		301
		23.89	31.0	-54.2	0.13					
		24.00	30.7	-53.8						
		24.15	30.0	-53.2						
		24.59	28.0	-50.1	-0.59					293

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ТАБЛИЦА РЕЗУЛЬТАТОВ ЗОНДИРОВАНИЯ

СТАНЦИЯ НИС АКАД. КОРОЛЕВ ТИП Р/З РКЗ-2 N ВЫПУСКА 79

ДАТА 25/09-77 ВРЕМЯ НАБЛ. 09,5 GMT. 21,5 МЕСТН.

N	К	ОБЛАЧНОСТЬ И АТМОСФЕРН. ЯВЛЕНИЯ				0.1 КМ		0.2 КМ		0.5 КМ	
		00/00				Д	V	Д	V	Д	V
		КОЛИЧ: ОБ:НЖ	ФОРМА 1:2:3:4:5:Г:Ф	ВЫСОТА УН	ПО						
		00:00	0:0:0:0:0:0:0			084	01	090	02	059	03

N	Шифр	H	P	T	G	U	Д	V	D	W
		0.01	1023	18.7		65	110	01	6.7	
		0.20	1001	17.7		61	089	02		
		0.21	1000	17.5		61	090	02	7.6	
		0.31	988	17.1		60	081	02		
		0.50	966	16.0	0.54	60	052	03		
		0.61	954	15.4		61	048	03		
		0.91	920	13.4		62	011	03		
		1.00	911	12.7	0.67	62	358	03		
		1.04	907	12.4		62	352	03	7.0	
		1.10	900	12.0		59	003	04	7.9	
3	1 НГ	1.27	882	11.0	0.64	48	032	04	10.5	
3	1 ВГ	1.47	861	12.4	-0.72	36	318	03	14.7	
		1.50	858	12.3		34	301	03		
		1.58	850	12.0		29	255	03	17.4	
3	1 НГ	1.91	817	10.6	0.42	9	332	02	31.7	
		1.97	811	10.6		5	322	02	37.6	
		2.00	808	10.6		5	316	02		
		2.08	800	10.6		6	300	03	36.0	
3	1 ВГ	2.65	748	11.6	-0.14	10	297	05	30.4	
3	4 НГ	2.94	722	11.1	0.16	13	284	06	27.2	
		3.00	717	10.9		14	292	06		293
		3.20	700	9.5		16	276	06	24.7	
3	3 НГ	3.86	646	5.1	0.65	22	259	03	20.2	
		4.00	635	4.7		22	267	04		
		4.46	600	3.1		25	292	06	18.2	
3	4 НГ	4.52	596	2.9	0.34	25	294	06	18.1	
3	0 НГ	4.92	566	0.0		28	295	07	16.3	
		5.00	561	-0.7	0.74	28	295	07		
3	3 НГ	5.27	542	-3.3	0.99	31	302	07	14.6	
		5.90	500	-7.0		36	321	07	12.5	
		6.00	494	-7.7	0.60	36	320	07		
		6.07	489	-8.2		37	320	07	12.0	
		7.00	434	-14.2	0.64	26	333	11		313
3	4 НГ	7.41	410	-16.5	0.57	24	333	13	15.8	
		7.60	400	-18.1		23	332	13	15.9	
		8.20	379	-21.4	0.82	22	332	14		
		8.59	350	-25.9		20	333	15	16.2	
		9.00	330	-29.6	0.82	19	332	16		
		9.05	328	-30.0		18	332	16	16.2	
		9.68	300	-35.7		19	326	17	15.3	
		10.00	286	-38.4	0.89	19	321	16		331
		10.92	250	-46.8		19	331	19	13.5	
		11.00	247	-47.5	0.90	19	334	19		
3	3 НГ	11.72	221	-53.9	0.89	20	338	21	12.3	
		12.00	212	-54.9	0.36	20	333	20		

N	Шифр	H	P	T	G	U	Д	V	D	W
		12.36	200	-56.7		28	325	17	11.8	
3	4 НГ	12.99	181	-59.2	0.44	21	314	18	11.2	333
		13.00	181	-59.3		21	314	18		
3	3 НГ	13.77	150	-66.7	0.96	23	310	18	9.7	
		14.00	151	-67.5		24	312	19		
5	0 НГ	14.13	150	-67.9	0.33	24	313	20	9.4	
		14.14	150	-67.9		24	313	20	9.4	
		14.37	144	-66.5	-0.61	24	315	20	9.5	
5	0 ПМТ	14.88	133	-68.4	0.36	24	319	21	9.3	
		15.00	130	-68.0		24	319	20		
		15.52	119	-63.0	-0.83	24	319	17	9.9	
		16.00	110	-62.6		24	319	14		
		16.05	109	-62.5	-0.10	24	320	13	10.0	
		16.60	100	-63.5		23	319	12	10.0	
		17.00	93.0	-63.4	0.10	23	319	10		352
5	0 ЗГ	17.35	88.0	-62.2	-0.34	23	319	10	10.3	
		18.00	79.7	-64.8		23	315	07		
		18.02	79.4	-65.0	0.40	23	314	07	10.0	
		18.80	70.0	-57.4		22	305	03	11.0	
		18.84	69.5	-56.7	-1.00	22	305	03	11.1	
		19.00	67.0	-58.3		22	303	02		
		19.63	61.7	-60.9	0.53	22	324	04	10.7	
		20.00	57.0	-58.1	-0.75	22	348	05		357
		20.53	53.1	-55.4	-0.51	21	016	07	11.6	
		20.92	50.0	-55.4		21	032	06	11.7	
		21.00	49.4	-55.9	0.11	21	035	06		
		21.44	45.0	-57.0	0.26	21	052	06	11.6	
		21.86	43.1	-54.0	-0.72	20	069	06	12.1	
		22.00	42.0	-54.0		20	071	06		
		23.00	36.1	-53.5	-0.04	20	087	06		
		24.00	30.0	-51.1	-0.24	19	087	06		354
		24.19	30.0	-51.2		19	086	07	12.9	
		25.00	26.0	-51.5	0.04		081	08		
		26.00	22.7	-50.4	-0.11		084	10		
		26.44	21.0	-50.0	-0.10		085	11		
		26.83	20.0	-48.7			085	12		
		27.00	19.5	-48.2	-0.32		085	12		
		28.00	16.0	-46.3	-0.18		084	14		394
		28.74	15.0	-44.8			082	14		
		29.00	14.4	-44.3			080	15		
		29.03	14.4	-44.2	-0.21		080	15		
		30.00	12.4	-44.4	0.03		076	16		
		31.00	10.7	-43.4	-0.11		077	15		
		31.29	10.2	-43.4	0.01		077	15		
		31.46	10.0	-43.0			077	15		
		32.00	9.0	-41.5	-0.27		077	15		446
		32.90	8.1	-39.2	-0.26		077	16		
		33.00	8.0	-39.3			077	16		
		34.00	6.0	-40.5	0.12		078	18		
		34.48	6.4	-41.2	0.15		080	18		
		35.00	5.0	-39.3	-0.36		082	20		
		36.00	5.1	-36.8						
		36.13	5.0	-36.6	-0.24					370

US RAWINSONDE ASCENSION # A.K.1

AKADEMIK KOROLEV 37.450 N 75.270 W

AUGUST 24, 1977 1152 GMT

ALTITUDE GEOP MTR	PRESSURE MB	TEMP DEG C	REL HUM PRCNT	DEW PT DEG C	DIR DEG	SPD MPS	NS MPS	EW MPS
4	1013.7	22.0	88	19.9	200	9.0	8.5	3.1
122	1000.0	22.0	83	19.0	999	999.9	999.9	999.9
210	990.0	22.0	80	18.3	999	999.9	999.9	999.9
662	940.0	23.1	62	15.3	999	999.9	999.9	999.9
1039	900.0	21.3	61	13.3	999	999.9	999.9	999.9
1532	850.0	17.7	62	10.3	999	999.9	999.9	999.9
1952	809.0	13.8	63	6.9	232	15.2	9.3	12.0
2046	800.0	13.1	63	6.2	233	16.0	9.7	12.7
2519	756.0	9.8	63	3.0	231	17.6	11.1	13.7
3152	700.0	5.1	93	4.0	239	20.1	10.3	17.3
4395	600.0	-0.6	100	-0.6	242	19.5	9.2	17.2
5073	551.0	-4.0	53	-12.2	232	19.0	11.7	15.0
5378	530.0	-6.5	94	-7.2	235	16.9	9.8	13.8
5831	500.0	-9.0	94	-9.8	234	20.5	12.2	16.5
6019	488.0	-10.2	100	-10.2	231	21.6	13.7	16.7
6357	467.0	-11.7	59	-18.2	228	18.0	12.1	13.4
6657	449.0	-13.5	68	-18.1	219	8.5	6.7	5.4
7526	400.0	-18.8	56	-25.4	237	17.0	9.4	14.2
8505	350.0	-26.2	63	-31.1	243	19.6	9.0	17.4
8994	327.0	-29.8	26	-43.1	253	18.2	5.3	17.4
9600	300.0	-35.0	49	-42.0	247	23.3	9.2	21.4
10029	282.0	-38.0	49	-44.8	248	24.7	9.3	22.8
10845	250.0	-44.9			250	23.7	8.1	22.2
12297	200.0	-56.2			285	13.0	-3.4	12.5
14088	150.0	-64.5			256	23.1	5.8	22.4
14509	140.0	-64.9			257	28.6	6.4	27.9
14913	131.0	-65.5			259	25.9	4.9	25.4
15197	125.0	-65.2			242	20.0	9.5	17.6
16552	100.0	-65.7			244	25.5	11.2	22.9
16928	94.0	-66.2			251	24.9	8.0	23.6
17691	83.0	-60.5			27	4.2	-3.8	-1.9
17919	80.0	-60.5			105	2.7	0.7	-2.6
18754	70.0	-58.7			223	3.8	2.8	2.6
19730	60.0	-55.4			154	2.4	2.2	-1.0
20891	50.0	-54.6			75	5.9	-1.5	-5.7
22324	40.0	-52.2			73	11.1	-3.2	-10.6
24196	30.0	-50.6			180	6.1	6.1	0.
25388	25.0	-48.6			65	6.8	-2.9	-6.1
26860	20.0	-46.8			82	11.7	-1.7	-11.6
27749	17.5	-44.6			92	15.0	0.4	-15.0
28781	15.0	-44.1			102	14.3	2.9	-14.1
30010	12.5	-42.4			80	20.8	-3.5	-20.5
31519	10.0	-41.2			101	18.3	3.5	-17.9
33041	8.0	-39.1			83	17.7	-2.1	-17.6
33959	7.0	-37.2			999	999.9	999.9	999.9

US RAWINSONDE ASCENSION # A.K.2

AKADEMIK KOROLEV 37.450 N 75.270 W

AUGUST 24, 1977 1446 GMT

ALTITUDE GEOP MTR	PRESSURE MB	TEMP DEG C	REL HUM PRCNT	DEW PT DEG C	DIR DEG	SPD MPS	NS MPS	EW MPS
4	1014.5	21.8	89	19.8	200	11.0	10.3	3.8
128	1000.0	20.3	87	18.1	999	999.9	999.9	999.9
250	986.0	18.9	85	16.3	999	999.9	999.9	999.9
453	963.0	18.5	76	14.2	999	999.9	999.9	999.9
735	932.0	20.7	80	17.1	999	999.9	999.9	999.9
1036	900.0	19.7	66	13.1	999	999.9	999.9	999.9
1526	850.0	16.6	76	12.4	999	999.9	999.9	999.9
2039	800.0	12.9	82	9.8	999	999.9	999.9	999.9
2425	764.0	10.2	76	6.2	999	999.9	999.9	999.9
3146	700.0	5.5	94	4.6	999	999.9	999.9	999.9
3372	681.0	4.3	90	2.8	237	15.9	8.7	13.3
4300	607.0	-0.6	98	-0.9	253	12.9	3.8	12.3
4392	600.0	-1.1	96	-1.7	250	13.0	4.5	12.2
5615	514.0	-6.8	78	-9.9	245	15.2	6.3	13.8
5830	500.0	-8.4	78	-11.5	246	14.8	6.1	13.5
7531	400.0	-18.0	72	-21.9	246	16.9	6.9	15.5
8515	350.0	-24.3	65	-29.0	238	21.3	11.2	18.1
9621	300.0	-32.0	57	-37.6	237	27.5	15.0	23.1
10537	263.0	-39.0	50	-45.4	241	27.7	13.4	24.2
10881	250.0	-42.0			243	30.1	13.5	26.9
11702	221.0	-48.8			239	30.6	15.7	26.3
11973	212.0	-51.8			237	31.3	17.0	26.3
12346	200.0	-54.9			236	33.1	18.6	27.4
13046	179.0	-59.2			242	38.0	17.9	33.5
13592	164.0	-60.6			239	36.6	18.7	31.5
14144	150.0	-62.6			248	28.4	10.5	26.3
14746	136.0	-64.1			242	14.8	6.9	13.1
15264	125.0	-62.9			226	23.9	16.7	17.1
16637	100.0	-61.1			263	18.0	2.2	17.9
18031	80.0	-58.2			187	10.4	10.3	1.3
18875	70.0	-55.6			228	11.9	8.0	8.9
19860	60.0	-53.9			22	1.0	-0.9	-0.4
21032	50.0	-53.1			107	7.6	2.2	-7.3
22476	40.0	-51.1			88	17.5	-0.5	-17.5
24352	30.0	-50.1			199	4.9	4.6	1.6
25547	25.0	-47.6			64	14.8	-6.5	-13.3
27025	20.0	-46.2			106	15.3	4.3	-14.7
27917	17.5	-41.4			88	17.9	-0.6	-17.8
28967	15.0	-39.6			94	14.0	1.0	-13.9
30067	12.8	-32.6			999	999.9	999.9	999.9

US RAWINSONDE ASCENSION # A.K.3

AKADEMIK KOROLEV 37.450 N 75.270 W

AUGUST 24, 1977 2315 GMT

ALTITUDE GEOP MTR	PRESSURE MB	TEMP DEG C	REL HUM PRCNT	DEW PT DEG C	DIR DEG	SPD MPS	NS MPS	EW MPS
4	1010.0	23.0	84	20.2	320	5.0	-3.8	3.2
90	1000.0	21.5	86	19.0	999	999.9	999.9	999.9
265	980.0	18.4	90	16.7	999	999.9	999.9	999.9
552	948.0	20.8	95	19.9	999	999.9	999.9	999.9
1000	900.0	18.3	95	17.4	999	999.9	999.9	999.9
1489	850.0	16.0	88	13.9	999	999.9	999.9	999.9
1641	835.0	14.8	91	13.3	216	11.1	9.0	6.6
1888	811.0	13.8	73	9.0	214	12.5	10.4	7.0
2002	800.0	12.9	81	9.6	212	12.5	10.6	6.7
2432	760.0	10.2	94	9.3	214	14.2	11.9	7.8
2698	736.0	8.7	55	0.2	215	17.0	13.8	9.8
3065	704.0	7.0	89	5.2	203	16.3	14.9	6.5
3111	700.0	6.6	90	5.1	203	16.2	15.0	6.3
4095	620.0	-1.3	97	-1.8	203	18.9	17.4	7.4
4356	600.0	-2.5	65	-8.5	208	17.6	15.5	8.3
4396	597.0	-2.7	60	-9.5	209	17.4	15.2	8.4
4652	578.0	-3.2	100	-3.2	219	17.4	13.5	11.0
5247	536.0	-5.0	100	-5.0	233	18.1	10.9	14.4
5530	517.0	-6.7	87	-8.4	233	18.2	11.0	14.5
5789	500.0	-8.4	96	-8.9	234	18.0	10.6	14.6
7489	400.0	-18.4	93	-19.3	228	22.3	14.8	16.6
7583	395.0	-19.0	100	-19.0	229	22.8	14.9	17.2
7909	378.0	-21.5	68	-25.8	232	23.2	14.2	18.4
8472	350.0	-24.9	84	-26.9	237	22.3	12.2	18.6
8598	344.0	-25.6	89	-26.9	237	21.4	11.6	18.0
9571	300.0	-33.5	65	-37.7	239	26.2	13.6	22.4
9954	284.0	-37.2	50	-43.9	240	25.0	12.5	21.6
10819	250.0	-44.9			243	29.7	13.6	26.4
12271	200.0	-56.5			236	28.9	16.3	23.8
13971	152.0	-65.7			238	35.9	19.0	30.5
14051	150.0	-65.6			240	36.2	18.1	31.4
14603	137.0	-63.7			257	33.2	7.7	32.3
15164	125.0	-64.0			261	23.4	3.8	23.1
15569	117.0	-64.1			263	17.0	2.1	16.9
16228	105.0	-66.1			268	17.3	0.6	17.3
16524	100.0	-64.1			263	15.6	1.8	15.5
17889	80.0	-65.2			244	13.8	6.1	12.4
18716	70.0	-59.5			302	3.3	-1.8	2.8
19683	60.0	-57.7			275	1.6	-0.1	1.6
20832	50.0	-57.3			322	0.7	-0.6	0.4
22247	40.0	-55.5			242	3.8	1.8	3.4
24089	30.0	-54.2			88	18.1	-0.5	-18.1
25258	25.0	-52.1			104	8.8	2.1	-8.6
26706	20.0	-50.1			999	999.9	999.9	999.9
26838	19.6	-49.4			999	999.9	999.9	999.9

US RAWINSONDE ASCENSION # A.K.4

AKADEMIK KOROLEV 37.450 N 75.270 W

AUGUST 25, 1977 1134 GMT

ALTITUDE GEOP MTR	PRESSURE MB	TEMP DEG C	REL HUM PRCNT	DEW PT DEG C	DIR DEG	SPD MPS	NS MPS	FW MPS
4	1018.4	16.2	90	14.5	360	9.0	-9.0	0.
158	1000.0	15.0	82	11.9	999	999.9	999.9	999.9
556	954.0	13.6	63	6.6	999	999.9	999.9	999.9
816	925.0	14.6	62	7.4	999	999.9	999.9	999.9
1046	900.0	13.1	54	4.1	999	999.9	999.9	999.9
1065	898.0	13.0	54	3.8	999	999.9	999.9	999.9
1341	869.0	14.2	42	1.4	999	999.9	999.9	999.9
1526	850.0	13.2	41	0.2	999	999.9	999.9	999.9
1596	843.0	12.8	41	-0.2	999	999.9	999.9	999.9
1858	817.0	11.3	54	2.2	314	11.6	-8.0	8.3
2033	800.0	10.5	58	2.5	306	11.9	-7.0	9.7
2691	739.0	8.5	42	-3.7	297	13.1	-5.9	11.7
2998	712.0	8.9			300	12.0	-6.0	10.3
3137	700.0	8.4			299	12.4	-5.9	10.8
4396	600.0	3.6			285	17.4	-4.5	16.8
4725	576.0	1.0			274	13.8	-0.8	13.7
5007	556.0	-2.2			278	11.4	-1.6	11.3
5842	500.0	-5.7			300	15.2	-7.6	13.2
5985	491.0	-6.5			297	15.1	-6.9	13.4
6242	475.0	-9.5			284	12.3	-2.9	11.9
7305	413.0	-17.1			288	14.4	-4.3	13.7
7451	405.0	-19.6			280	10.0	-1.8	9.8
7542	400.0	-20.3			283	11.0	-2.5	10.7
8515	350.0	-28.3			277	15.7	-1.9	15.6
9599	300.0	-37.6			266	16.9	1.1	16.9
10826	250.0	-48.4			261	16.4	2.5	16.2
12258	200.0	-57.2			251	20.9	6.9	19.7
12816	183.0	-59.5			247	23.6	9.2	21.7
14050	150.0	-62.9			275	18.5	-1.7	18.4
14133	148.0	-63.3			278	18.6	-2.6	18.4
15173	125.0	-63.2			272	18.2	-0.7	18.2
16539	100.0	-64.7			272	16.5	-0.5	16.5
16601	99.0	-64.8			273	16.0	-0.7	16.0
17927	80.0	-58.4			283	11.0	-2.5	10.7
18762	70.0	-59.9			244	3.3	1.5	2.9
19728	60.0	-57.4			296	12.3	-5.4	11.1
20882	50.0	-56.4			95	9.6	0.9	-9.6
22313	40.0	-52.5			112	8.7	3.3	-8.0
24179	30.0	-50.5			29	5.2	-4.6	-2.5
25368	25.0	-49.1			92	11.5	0.4	-11.5
26833	20.0	-48.2			67	9.6	-3.8	-8.8
27715	17.5	-46.6			99	15.4	2.4	-15.2
28744	15.0	-44.8			90	14.2	0.	-14.2
29964	12.5	-44.1			84	15.1	-1.5	-15.1
31464	10.0	-43.2			92	17.7	0.6	-17.7
32971	8.0	-41.2			84	22.0	-2.3	-21.9
33880	7.0	-40.4			999	999.9	999.9	999.9

US RAWINSONDE ASCENSION # A.K.5

AKADEMIK KOROLEV 37.450 N 75.270 W

AUGUST 25, 1977 1446 GMT

ALTITUDE GEOP MTR	PRESSURE MB	TEMP DEG C	REL HUM PRCNT	DEW PT DEG C	DIR DEG	SPD MPS	NS MPS	EW MPS
4	1020.7	17.2	72	12.0	360	6.0	-6.0	0.
178	1000.0	15.7	61	8.2	999	999.9	999.9	999.9
238	993.0	15.2	58	6.9	999	999.9	999.9	999.9
488	964.0	12.9	74	8.3	999	999.9	999.9	999.9
763	933.0	13.2	44	1.2	999	999.9	999.9	999.9
1000	907.0	13.1			999	999.9	999.9	999.9
1064	900.0	12.8			999	999.9	999.9	999.9
1542	850.0	12.8			999	999.9	999.9	999.9
1751	829.0	12.5			354	7.9	-7.8	0.8
2048	800.0	11.5			329	10.8	-9.3	5.5
3156	700.0	9.2			301	10.0	-5.1	8.6
4410	600.0	2.5			292	13.3	-5.0	12.3
5858	500.0	-5.7			270	9.4	0.	9.4
7556	400.0	-20.0			273	12.9	-0.7	12.9
8529	350.0	-28.6			275	17.3	-1.4	17.2
9612	300.0	-37.2			256	14.6	3.5	14.2
10841	250.0	-47.6			278	16.0	-2.3	15.8
12031	208.0	-54.9			264	23.6	2.6	23.4
12281	200.0	-55.2			264	21.3	2.1	21.2
13801	157.0	-61.9			257	18.5	4.2	18.0
14082	150.0	-62.4			265	17.9	1.6	17.8
14965	130.0	-63.8			267	18.6	0.9	18.6
15205	125.0	-62.6			266	16.6	1.2	16.6
16579	100.0	-63.2			278	15.8	-2.2	15.7
17959	80.0	-60.7			277	17.0	-2.1	16.9
18797	70.0	-56.3			282	11.9	-2.5	11.6
19778	60.0	-55.4			63	1.3	-0.6	-1.2
20940	50.0	-54.8			105	6.2	1.6	-6.0
22375	40.0	-51.9			128	1.4	0.9	-1.1
24255	30.0	-48.3			85	10.7	-0.9	-10.7
25454	25.0	-48.9			104	10.9	2.6	-10.6
26932	20.0	-44.5			95	14.2	1.2	-14.2
27827	17.5	-43.8			83	12.8	-1.7	-12.7
28863	15.0	-42.7			95	17.3	1.6	-17.2
30095	12.5	-42.4			81	12.4	-2.0	-12.3
31604	10.0	-40.7			999	999.9	999.9	999.9

US RAWINSONDE ASCENSION # A.K.6

AKADEMIK KOROLEV 37.450 N 75.270 W

AUGUST 25, 1977 2333 GMT

ALTITUDE GEOP MTR	PRESSURE MB	TEMP DEG C	REL HUM PRCNT	DEW PT DEG C	DIR DEG	SPD MPS	NS MPS	EW MPS
4	1022.3	19.4	62	12.0	70	3.0	-1.0	-2.8
193	1000.0	19.4	42	5.2	999	999.9	999.9	999.9
297	988.0	19.4	30	1.5	999	999.9	999.9	999.9
1005	909.0	13.5	61	6.2	999	999.9	999.9	999.9
1088	900.0	14.0	42	-3.7	999	999.9	999.9	999.9
1240	884.0	14.9			999	999.9	999.9	999.9
1568	850.0	12.7			116	4.8	2.2	-4.3
1950	812.0	11.2			54	0.1	-0.1	-0.1
2073	800.0	11.5			307	1.8	-1.1	1.5
2457	764.0	12.4			300	5.6	-2.8	4.8
3184	700.0	10.3			277	3.7	-0.5	3.7
4444	600.0	3.4			314	8.2	-5.7	5.9
5510	525.0	-4.7	21	-23.4	305	10.8	-6.2	8.8
5891	500.0	-7.2	22	-25.1	312	10.6	-7.0	7.9
6994	433.0	-15.2	22	-32.1	317	14.1	-10.3	9.6
7587	400.0	-19.2			320	17.5	-13.4	11.3
8201	368.0	-23.9			321	16.8	-13.1	10.6
8502	353.0	-27.6			320	15.3	-11.7	9.8
8563	350.0	-27.9			320	15.8	-12.1	10.1
9651	300.0	-36.8			330	13.7	-11.9	6.8
10885	250.0	-45.9			309	16.3	-10.2	12.7
12335	200.0	-55.3			310	13.7	-8.7	10.5
13651	162.0	-65.3			312	14.0	-9.4	10.4
14118	150.0	-65.7			288	14.2	-4.3	13.5
14535	140.0	-67.2			292	14.2	-5.3	13.1
15128	127.0	-61.7			310	21.9	-14.0	16.9
15226	125.0	-61.8			310	20.1	-13.0	15.3
16599	100.0	-63.3			310	15.6	-9.9	12.0
17976	80.0	-63.0			311	12.5	-8.2	9.4
18808	70.0	-56.3			324	5.5	-4.4	3.2
19782	60.0	-55.5			283	3.4	-0.8	3.4
20946	50.0	-54.3			52	5.0	-3.1	-3.9
22373	40.0	-53.9			76	8.7	-2.1	-8.4
24230	30.0	-50.3			55	6.6	-3.8	-5.4
24589	28.4	-49.3			999	999.9	999.9	999.9

US RAWINSONDE ASCENSION • A.K.7

AKADEMIK KOROLEV 37.450 N 75.270 W

AUGUST 26, 1977 226 GMT

ALTITUDE GEOP MTR	PRESSURE MB	TEMP DEG C	REL HUM PRCNT	DEW PT DEG C	DIR DEG	SPD MPS	NS MPS	EW MPS
4	1023.3	18.5	62	11.1	110	1.0	0.3	-0.9
201	1000.0	18.0	61	10.3	999	999.9	999.9	999.9
1094	900.0	12.4	61	5.0	999	999.9	999.9	999.9
1141	895.0	12.1	60	4.6	999	999.9	999.9	999.9
1426	865.0	13.2			106	4.3	1.2	-4.1
1572	850.0	12.5			108	2.7	0.8	-2.6
1984	809.0	11.1			327	1.2	-1.0	0.6
2077	800.0	11.3			318	1.9	-1.4	1.3
2581	753.0	12.3			290	4.7	-1.6	4.4
3188	700.0	10.4			274	5.7	-0.4	5.7
4449	600.0	3.7			293	5.3	-2.0	4.9
5894	500.0	-7.2			318	8.4	-6.2	5.6
7593	400.0	-18.8			337	11.3	-10.4	4.5
8572	350.0	-26.3			337	13.7	-12.6	5.4
9664	300.0	-36.0			326	17.3	-14.3	9.8
10899	250.0	-46.9			329	15.9	-13.7	8.2
12343	200.0	-56.2			328	20.2	-17.1	10.8
13615	163.0	-66.2			300	15.4	-7.7	13.3
14117	150.0	-66.6			297	16.7	-7.7	14.8
14709	136.0	-67.0			313	22.6	-15.5	16.4
15219	125.0	-65.1			322	24.8	-19.5	15.2
15520	119.0	-62.4			324	24.4	-19.8	14.3
16592	100.0	-62.7			319	15.9	-12.0	10.4
17380	88.0	-61.8			321	14.4	-11.2	9.1
17961	80.0	-65.7			320	11.5	-8.8	7.4
18790	70.0	-57.3			33	3.2	-2.7	-1.8
19756	60.0	-58.6			277	3.1	-0.4	3.1
20915	50.0	-55.0			59	6.8	-3.5	-5.9
22342	40.0	-53.3			98	8.6	1.2	-8.5
24202	30.0	-51.0			84	5.7	-0.7	-5.7
25388	25.0	-50.7			84	10.5	-1.2	-10.4
26849	20.0	-47.6			86	13.4	-0.9	-13.4
27733	17.5	-46.4			84	13.5	-1.5	-13.4
28760	15.0	-44.7			72	15.5	-4.9	-14.7
29980	12.5	-44.2			74	15.1	-4.2	-14.5
31478	10.0	-42.8			78	14.7	-3.0	-14.4
32991	8.0	-41.0			71	16.4	-5.4	-15.4
33899	7.0	-41.1			74	18.3	-5.1	-17.5
34946	6.0	-40.8			72	18.4	-5.6	-17.5
36192	5.0	-39.0			73	20.6	-5.9	-19.7
37390	4.2	-37.9			999	999.9	999.9	999.9

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15. Supplementary Notes

16. Abstract

In 1971, the National Aeronautics and Space Administration in the United States and the Academy of Sciences in the Union of Soviet Socialist Republics, agreed to a coordinated program of rocketsonde investigations along about 60°E and 70°W Longitudes. The Americans agreed to coordinate launchings along 70°W with the Cooperative Meteorological Rocket Network (CMRN) in the US and the Experimental Inter-American Meteorological Rocketsonde Network (EXAMETNET) in the Southern Hemisphere and the NASA launch site at Wallops Flight Center, Virginia. The Hydrometeorological Service of the USSR, on behalf of the USSR Academy of Sciences, agreed to provide data from sites along 60°E. It was recognized early in these investigations that the rocketsonde instruments used by the US and USSR needed to be compared if useful results were to be obtained. As a result of an internationally coordinated rocket intercomparison held in 1973 it was learned that large differences existed between the measurements obtained with the US and USSR instruments. After examination of the instruments and adjustments to techniques were completed, it was agreed that an intercomparison of the US Super Loki Datasonde and the USSR M100B rocketsonde should be conducted. It was agreed that 22 pairs of rocket instruments, half scheduled for daytime and half for nighttime, would be launched. The actual launchings commenced on August 10, 1977, with the Soviets launching from their ship, the Research Vessel Akademik Korolev, and the Americans from the launch complex at NASA's Wallops Flight Center, Virginia. Except for minor variations in the launch schedule, all rocketsondes were launched as planned.

Results indicate that the US/USSR rocketsonde measurement agreement improved since the 1973 intercomparisons. It was learned that the mean of the differences of the temperatures compare to within 6°C at about 60 km and to within 2°C near 50 km. However, the root-mean-square differences are much larger. Wind measurements were found to agree, in the mean, to within 3 ms^{-1} up to 57 km.

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