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**Meteorological Observations at Schmidt, Northern Sakhalin,
August 1995 - August 1998*, ****

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Abstract: Meteorological observations were carried out at Schmidt, northern end of Sakhalin during the period from August 1995 to August 1998, as part of the Japan-Russia cooperative research project "Sea Ice Studies off the Okhotsk Sea Coast of Sakhalin". Time series data of wind, air temperature, humidity and solar radiation were summarized in this report.

要旨:「日本・ロシア両国によるオホーツク海・サハリン沖海水の共同調査」の一環として、サハリン北端のシュミットで、1995年8月から1998年8月まで気象観測調査を実施した。本報告では、シュミットに設置した無人気象観測装置で収集した風向・速、気温、湿度、日射量等の観測資料を提示する。

Key words: Meteorological variables, Schmidt, Northern Sakhalin, Sea of Okhotsk

キーワード: 気象要素、シュミット、北サハリン、オホーツク海

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I. Introduction

The Japan-Russia cooperative research project, "Sea Ice Studies off the Okhotsk Sea Coast of Sakhalin" has been carried out since 1992, to investigate long-term hydrometeorological and climatological characteristics and physical processes of sea-ice formation in northern Sakhalin. The field experiments of hydrometeorological and sea-ice studies have been carried out at Chaivo Bay (Fig. 1) since 1992, as a representative field site of the northern Okhotsk Sea. Some of the hydrometeorological variables and sea-ice characteristics obtained from those field experiments were reported in Shirasawa *et al.* (1994, 1996 and 1998). Meteorological observations were also carried out at Schmidt, northern end of Sakhalin (Fig. 1) during the period from August 1995 to August 1998 to characterize atmospheric variables and sea-ice formation in northern Sakhalin throughout all the year round. Time series records obtained at Schmidt are summarized in this report.

II. Meteorological variables at Schmidt

The observation site at Schmidt (54°17.95'N, 142°32.16'E) is located at the shore of the Schmidt area, which faces to Severny Bay in the Sea of Okhotsk (Figs. 1 and 2). An automatic weather station (Data Logger Kadec, Kona System Co., Ltd.) was installed on the top of the shore cliff about 15 m high from the sea level in order to obtain general meteorological variables such as air temperature, humidity, wind speed and direction, and radiation through all the year round (Fig. 2). Two radiative temperature sensors (Tasco Co., Ltd.) were also installed near the weather station and at the edge of the cliff (Fig. 2). One sensor being faced to the sea surface to measure the surface temperature, the other was faced to the sky to measure the diffuse sky temperature.

Observed variables are summarized in Table 1. Time series records of air temperature, humidity, solar radiation, and wind speed and direction obtained during the period from early August 1995 to early October 1996 are shown in Fig. 3. Maximum wind speeds reached to 25 ms^{-1} in November 1995. Minimum air temperatures at about -30°C were observed at late January 1996 and maximum ones were at about 20°C in mid-June through late August 1996. The daily maximum incoming solar radiation varied from 0.1- 0.2 kWm^{-2} at early November through early January to 12.3 kWm^{-2} at early June.

Time series records of air, surface radiative and diffuse sky temperatures, and humidity obtained during the period from early October 1996 to mid-September 1997 are shown in Fig. 4. A minimum air temperature at about -30°C was observed at late December 1996 and maximum ones were at about 20°C at late July 1997. The surface radiative temperature varied

similarly as did the air temperature. The radiative temperature might indicate the surface temperature of snow/ice after freeze-up of the sea. The coastal areas of northern Sakhalin might be frozen at early November 1996 and the sea ice existed at least till the beginning of June 1997 on the northern coast of Sakhalin (Japan Meteorological Agency, 1997). But, one may doubt if the radiative temperature sensor might be affected by measuring errors caused by irregular reflections from the expanded target area of the sensor.

Time series records of air temperature, humidity, solar radiation, and wind speed and direction obtained during the period from mid-September 1997 to late August 1998 are shown in Fig. 5. Maximum wind speeds reached to about 23 ms^{-1} in November 1997. Minimum air temperatures at about -35°C were observed at early January 1998 and maximum ones were at about 25°C in June to July 1998. The daily maximum incoming solar radiation varied from $0.1\text{--}0.2 \text{ kWm}^{-2}$ at early November through early January to 0.9 kWm^{-2} at late April through mid-July.

Windroses for each month are shown in Fig. 6, indicating that the predominant wind directions were S to SSE during May through September and WNW during November through March.

Time series records of meteorological variables shown in Figs. 3 to 5 for each month are shown in Fig. 7.

In this report all time is used in the Japanese Standard Time (JST). The threshold value of wind speed is used as 0.3 ms^{-1} .

Acknowledgements. We wish to thank all staff at the Chaivo Research Station for their assistance and effort in the field. Thanks are due to Eriko Uematsu and Mayumi Ohtsuka for their assistance in data processing and drawing. Funding for this work was partly obtained from the Japanese Ministry of Education, Science and Culture (Monbusho) through grant-in-aid for the International Scientific Research Program "Sea Ice Studies off the Okhotsk Sea Coast of Sakhalin, Japan-Russia Cooperative Research" and through the Sea Ice Research Laboratory's Overseas Field Work Program.

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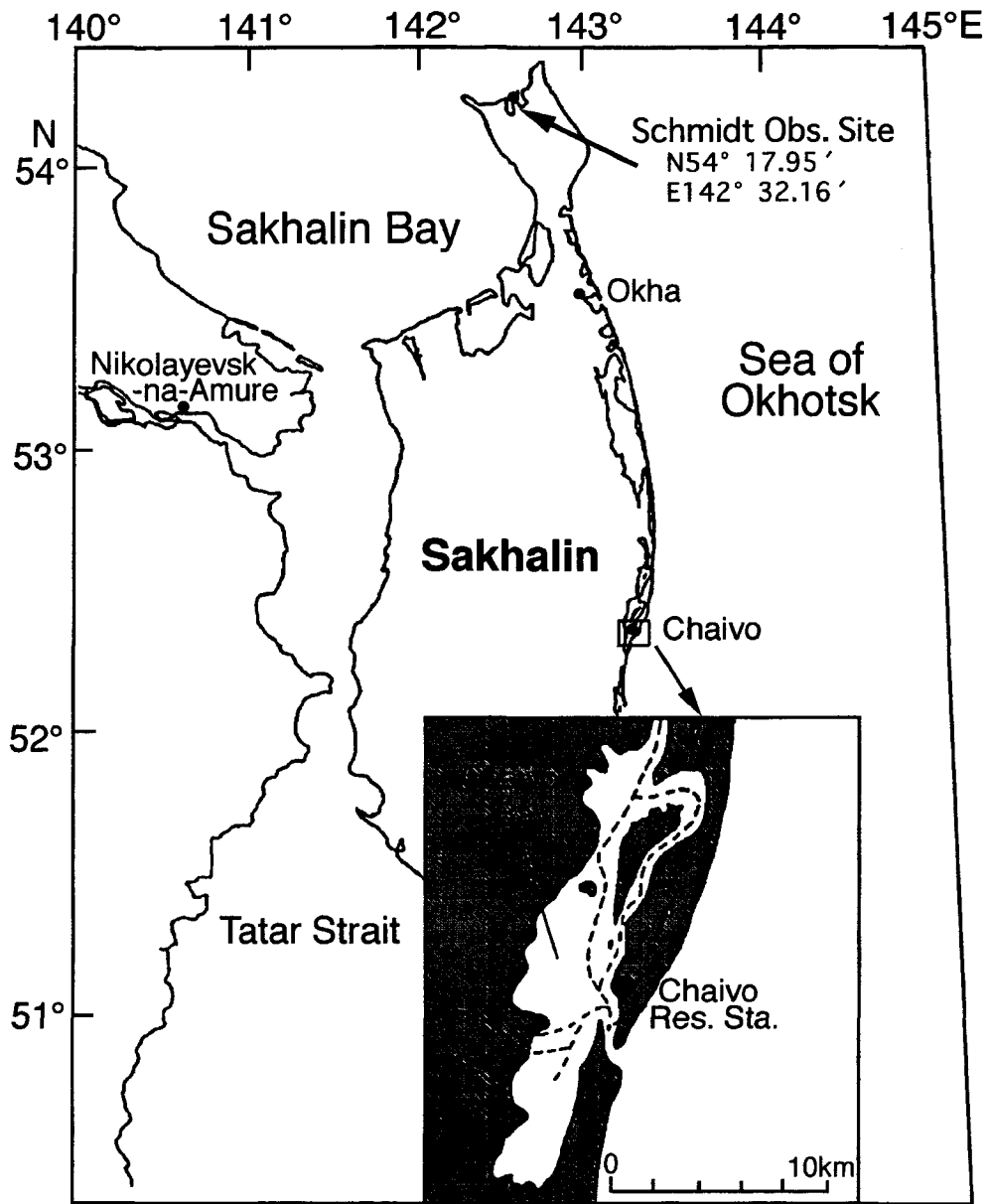


Fig. 1 A map of the observation site.

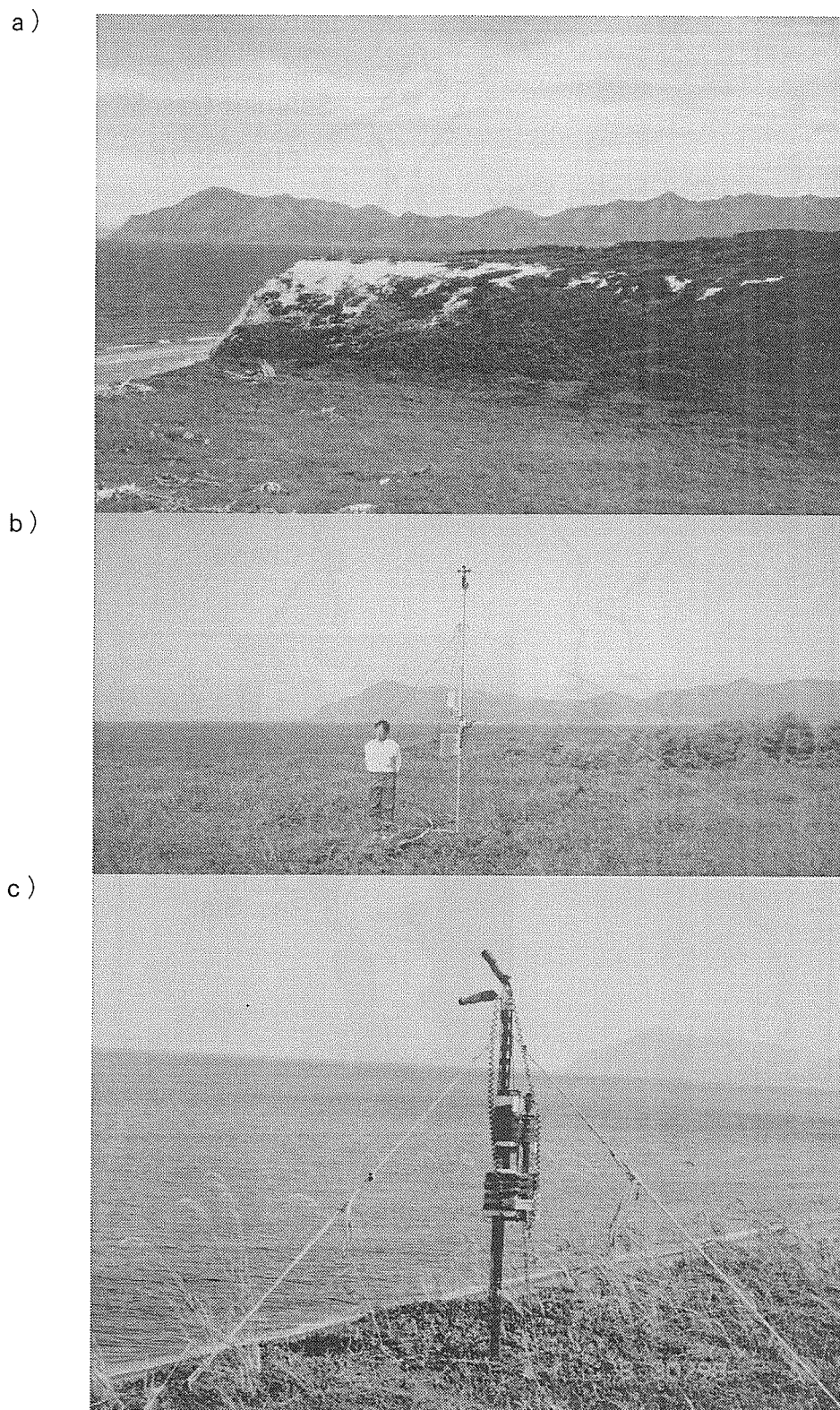


Fig. 2 Pictures of a) the observation site, b) the automatic weather station and c) the radiative temperature sensors installed at Schmidt.

Table1. Meteorological variables at Schmidt, northern Sakhalin during the period from August 1995 to August 1998.

Variables	Period
Wind speed, ms^{-1}	Aug. 1995 - Feb. 1996, Sep. 1997 - Aug. 1998
Wind direction, $^{\circ}$	Aug. 1995 - Oct. 1996, Sep. 1997 - Aug. 1998
Air temperature, $^{\circ}\text{C}$	Aug. 1995 - Aug. 1998
Surface radiative temperature, $^{\circ}\text{C}$	Oct. 1996 - Sep. 1997
Diffuse sky temperature, $^{\circ}\text{C}$	Oct. 1996 - Sep. 1997
Humidity, %	Aug. 1995 - Aug. 1998
Incoming solar radiation, kWm^{-2}	Aug. 1995 - Oct. 1996, Sep. 1997 - Aug. 1998

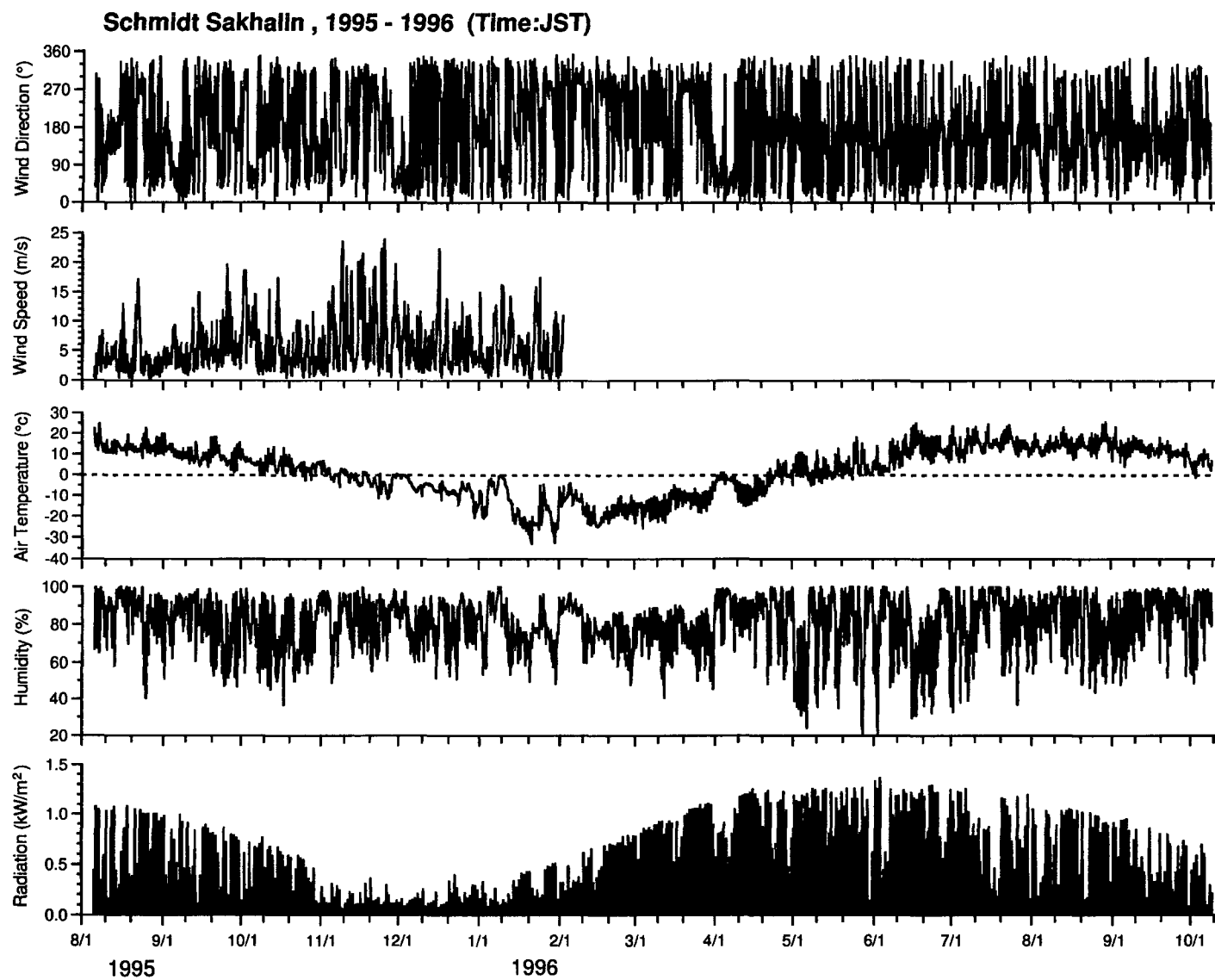


Fig. 3 Time series records of air temperature, humidity, solar radiation, and wind speed and direction obtained during the period from August 1995 to October 1996

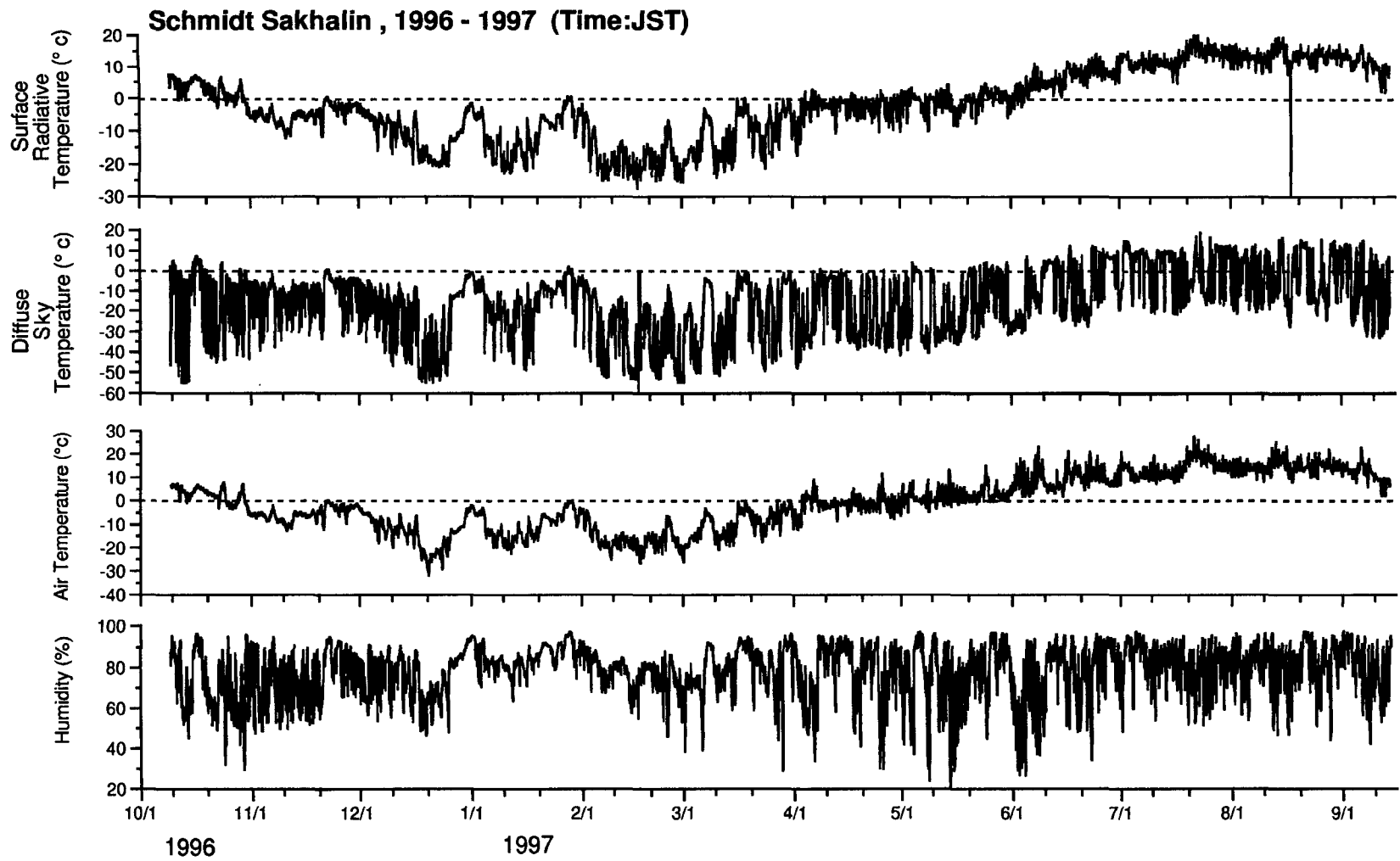


Fig. 4 Time series records of air, surface radiative and diffuse sky temperatures and humidity obtained during the period from October 1996 to September 1997

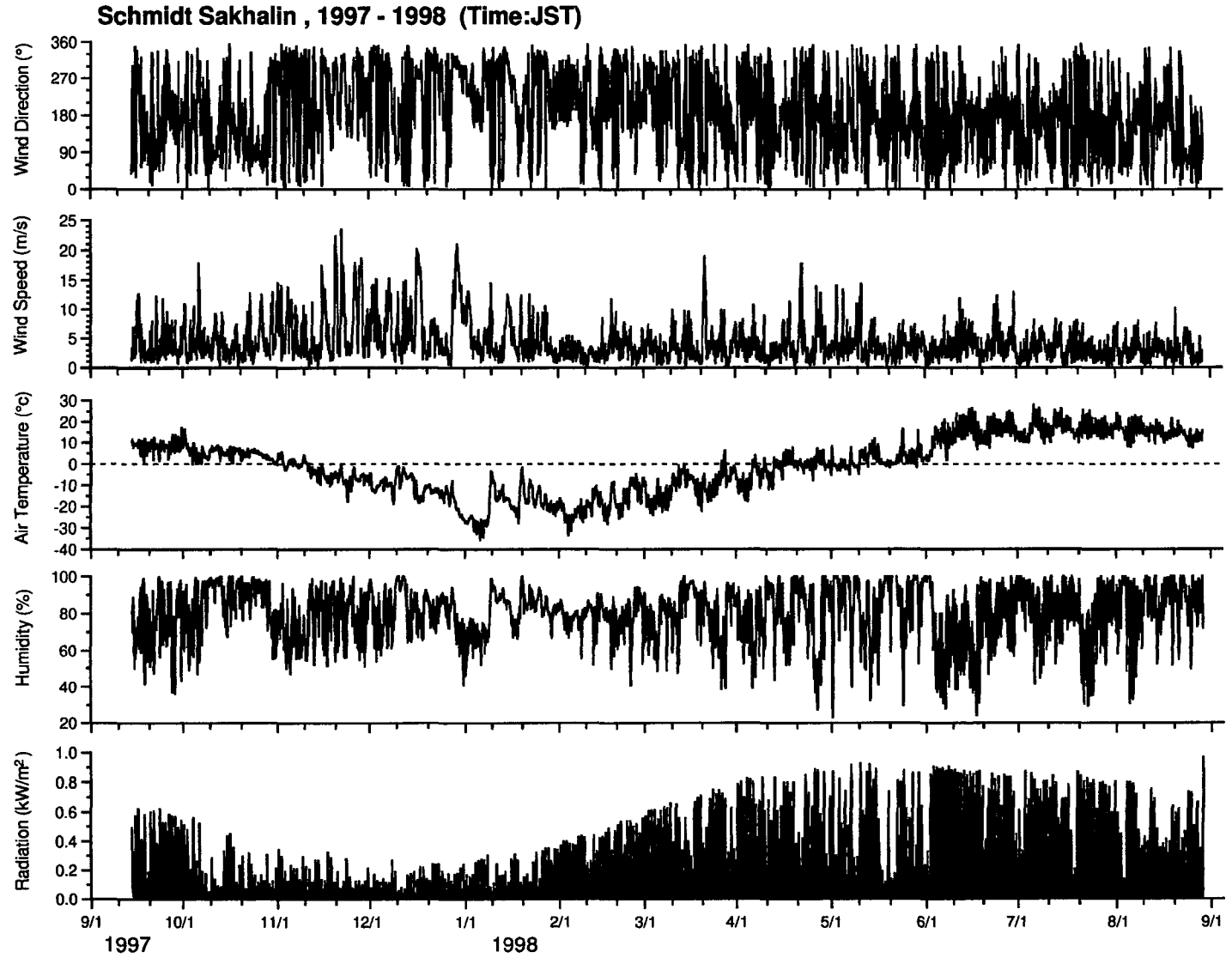


Fig. 5 Time series records of air temperature, humidity, solar radiation, and wind speed and direction obtained during the period from September 1997 to August 1998.

Schmidt Sakhalin , 1995 - 1996

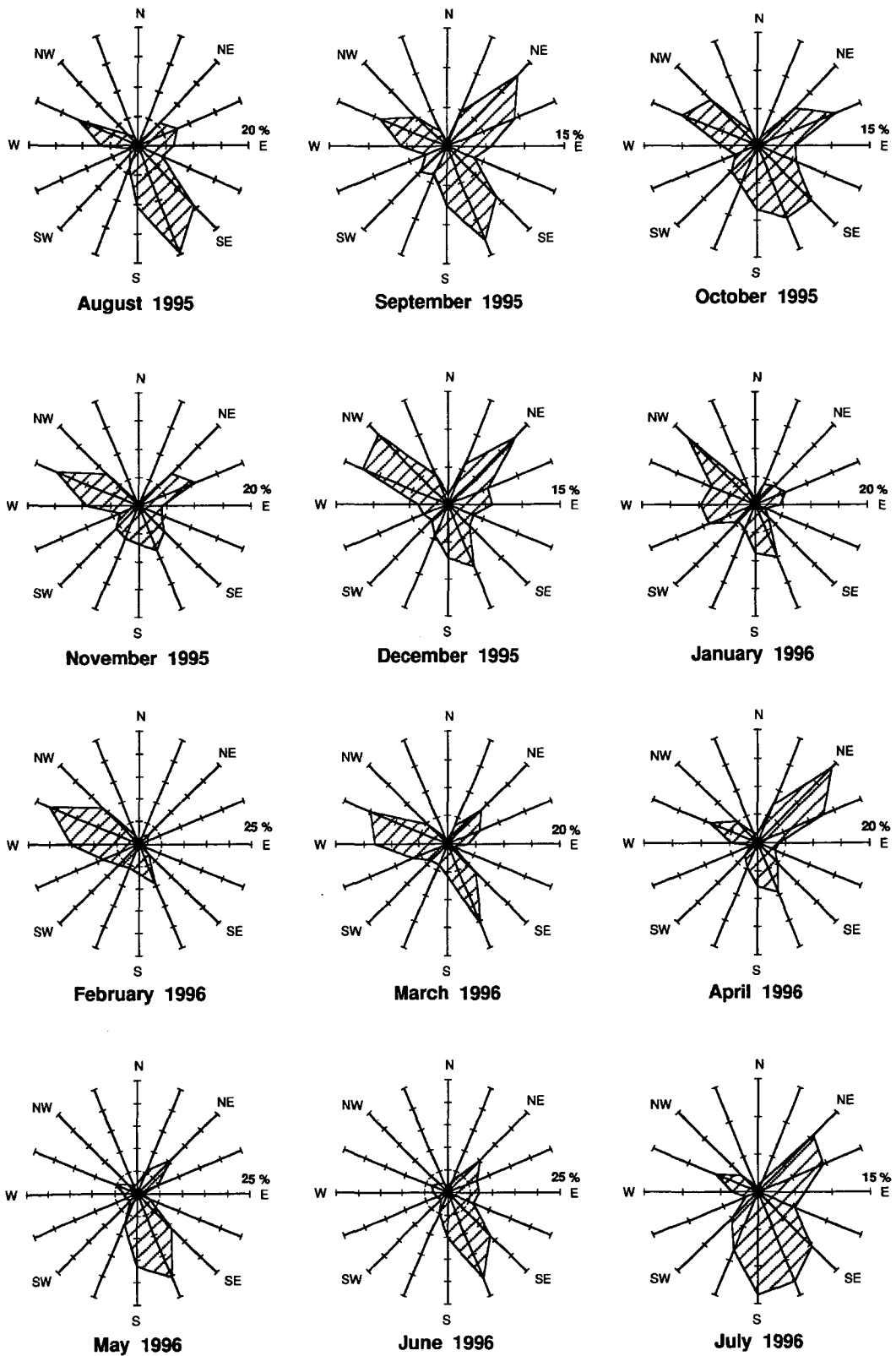
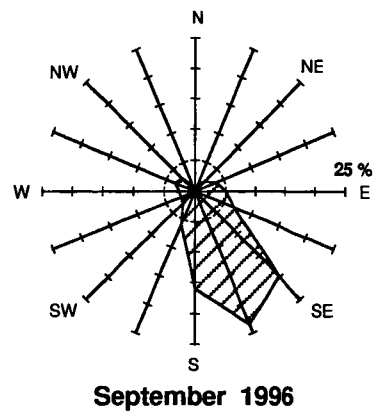
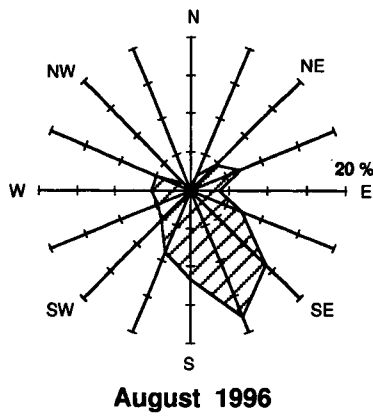
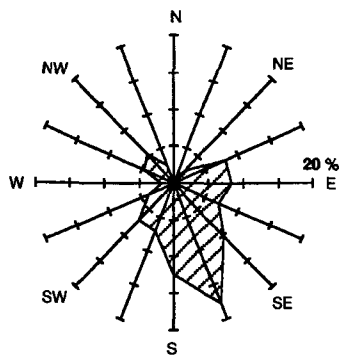


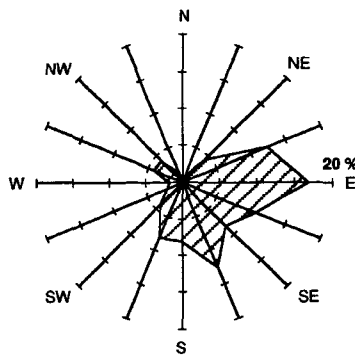
Fig. 6 Windroses for each month during the periods from August 1995 through September 1996 and from September 1997 through August 1998.

Schmidt Sakhalin , 1995 - 1996

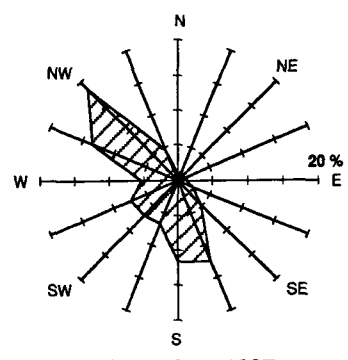
Schmidt Sakhalin , 1997 - 1998



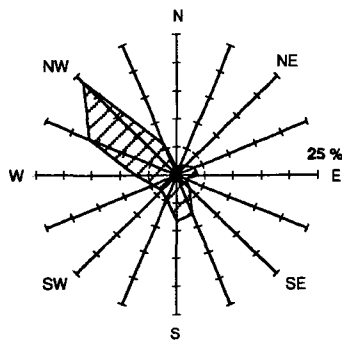
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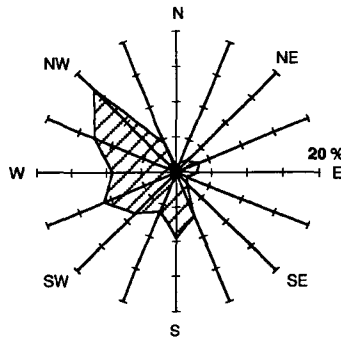
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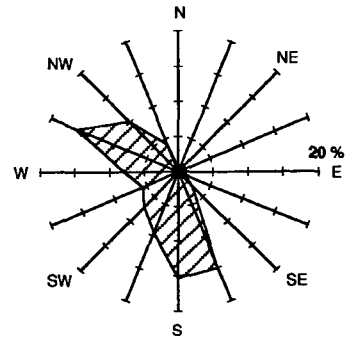
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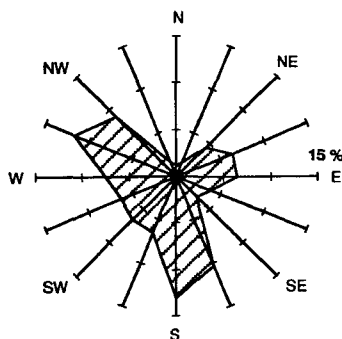
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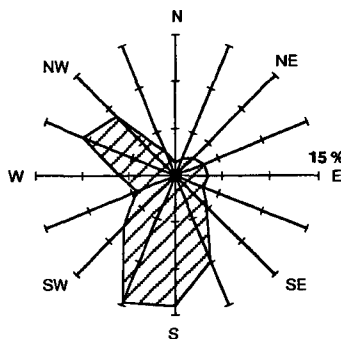
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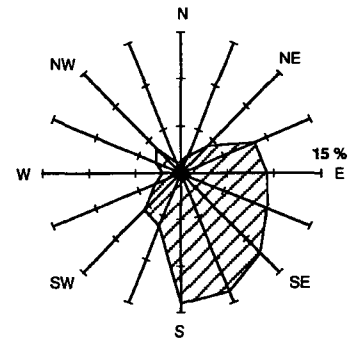
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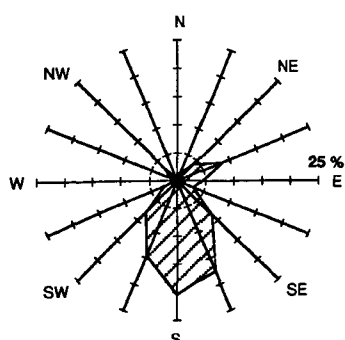
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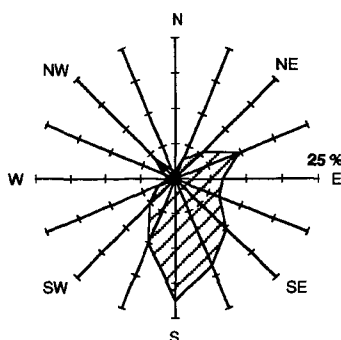
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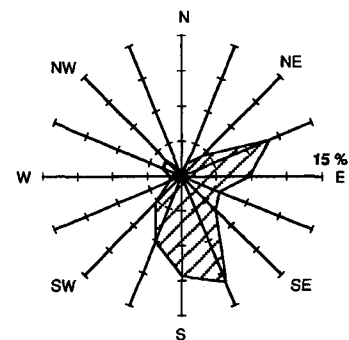
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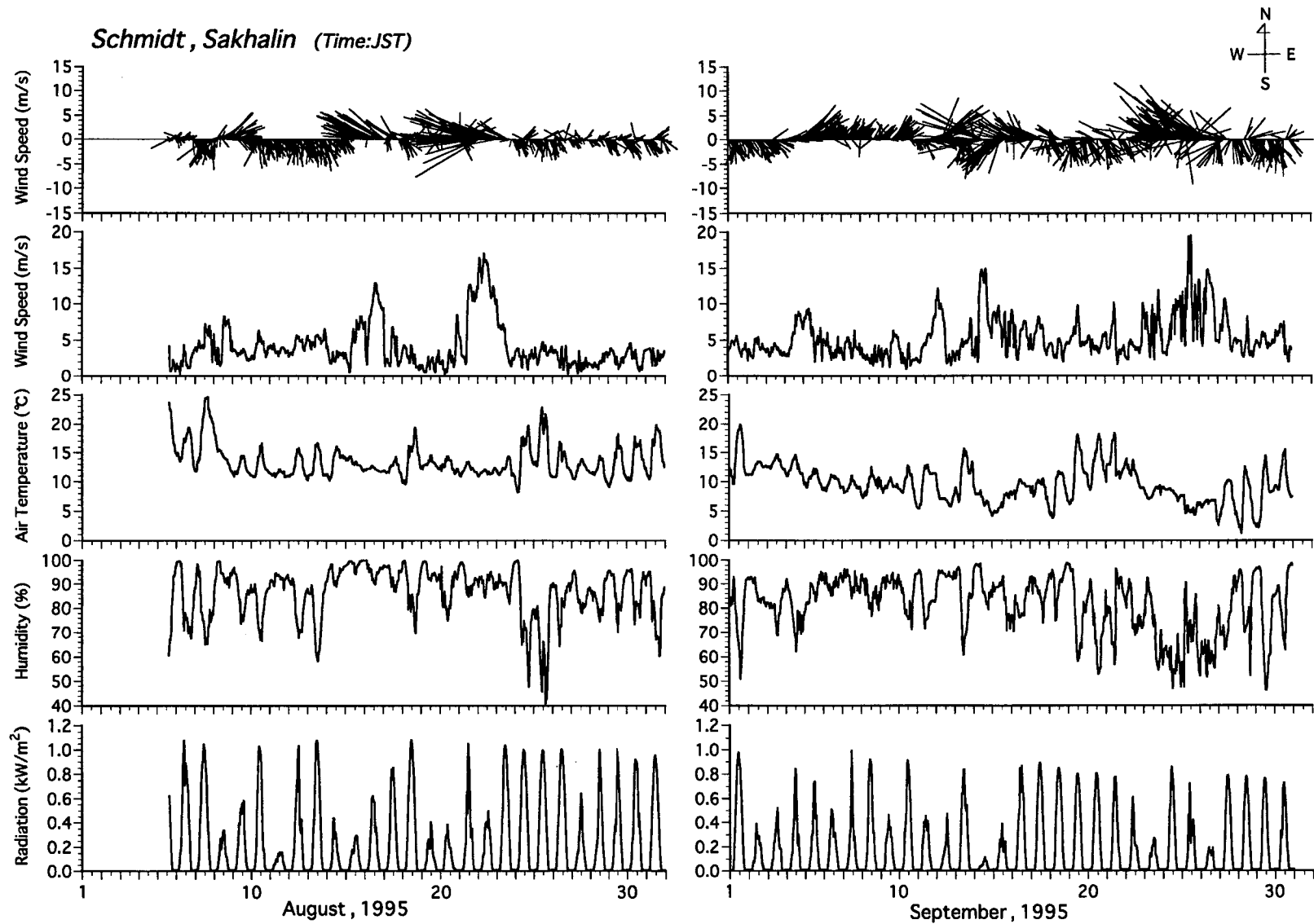
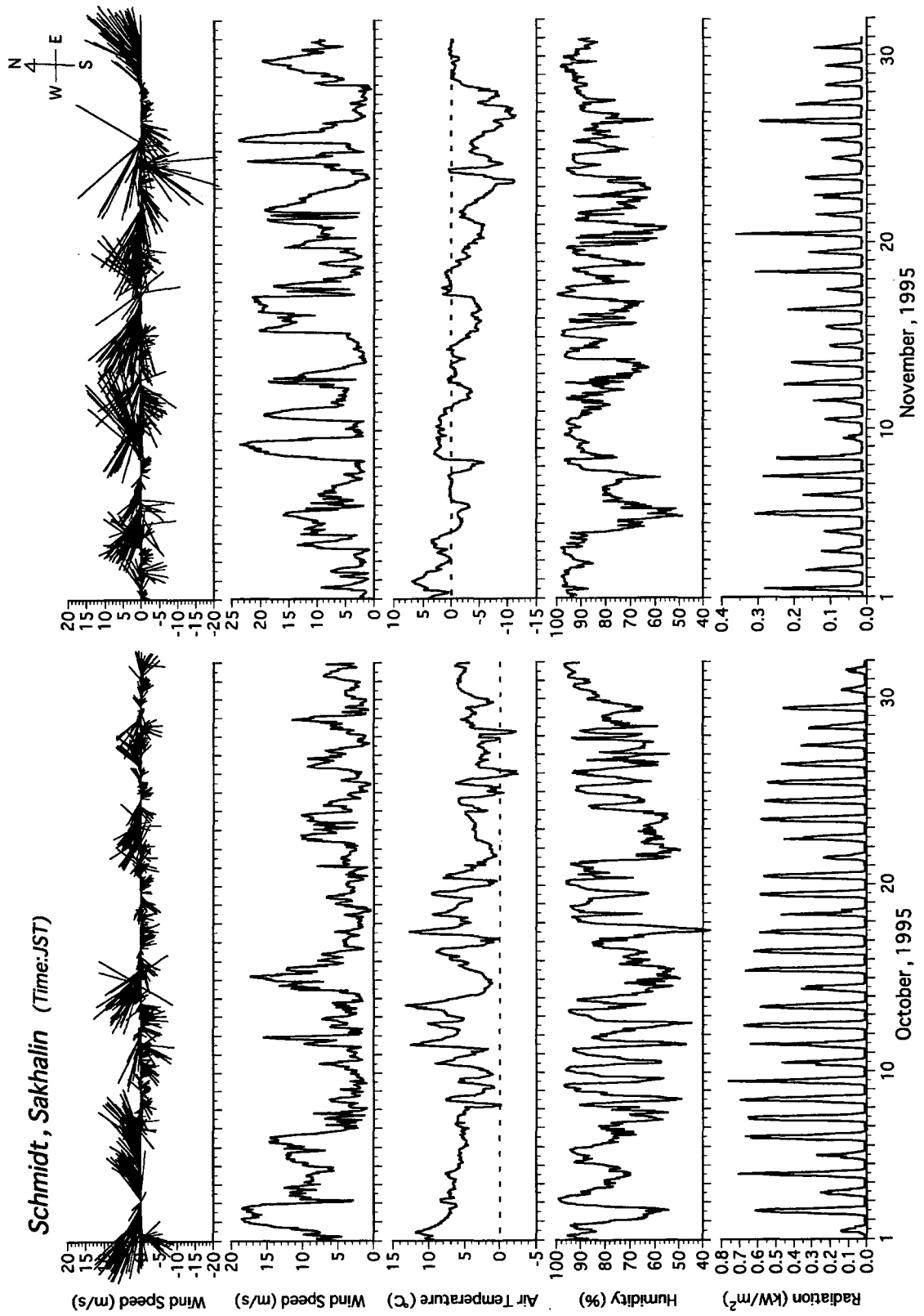
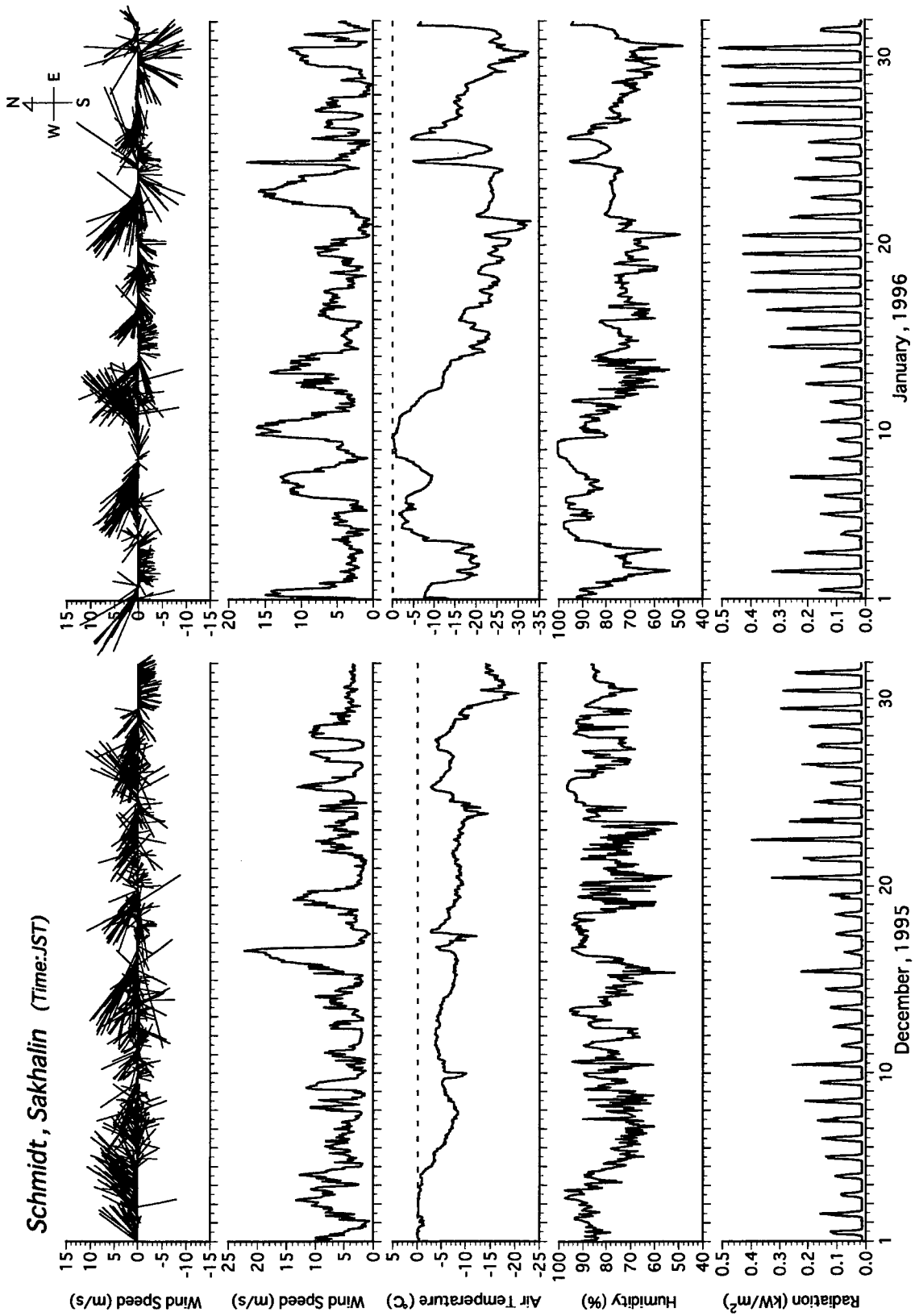
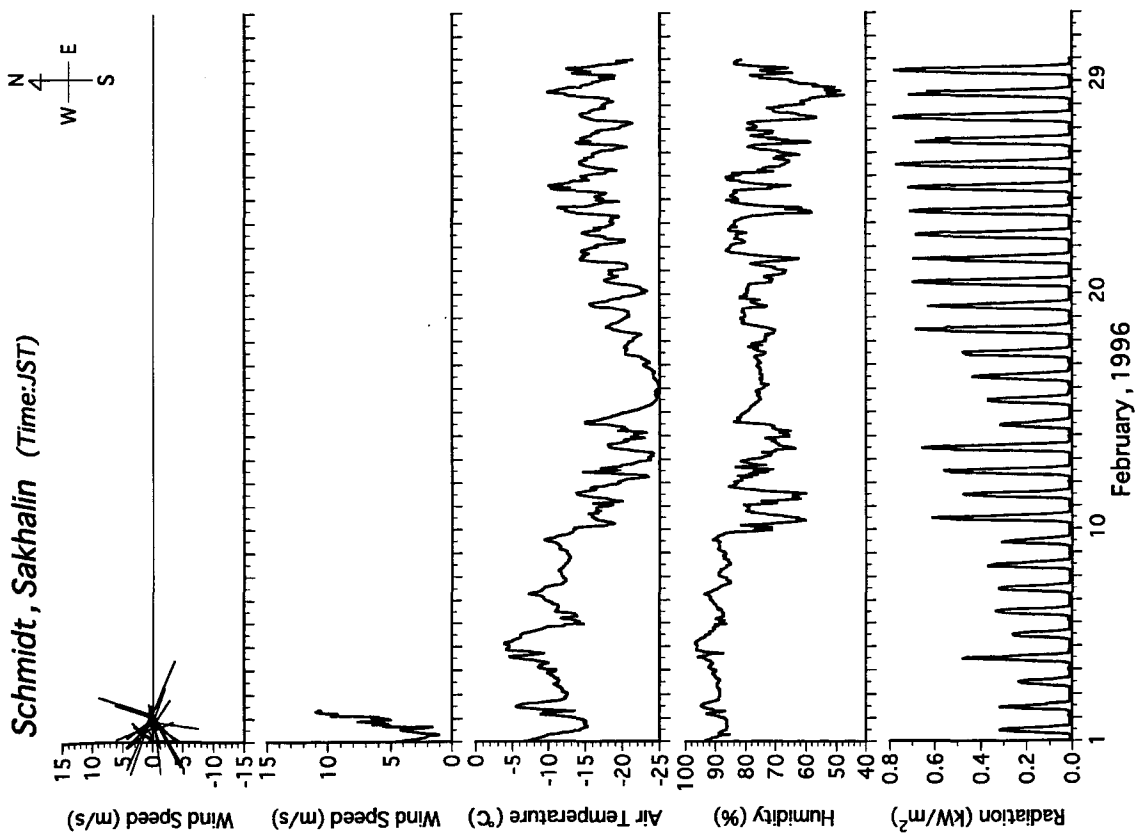


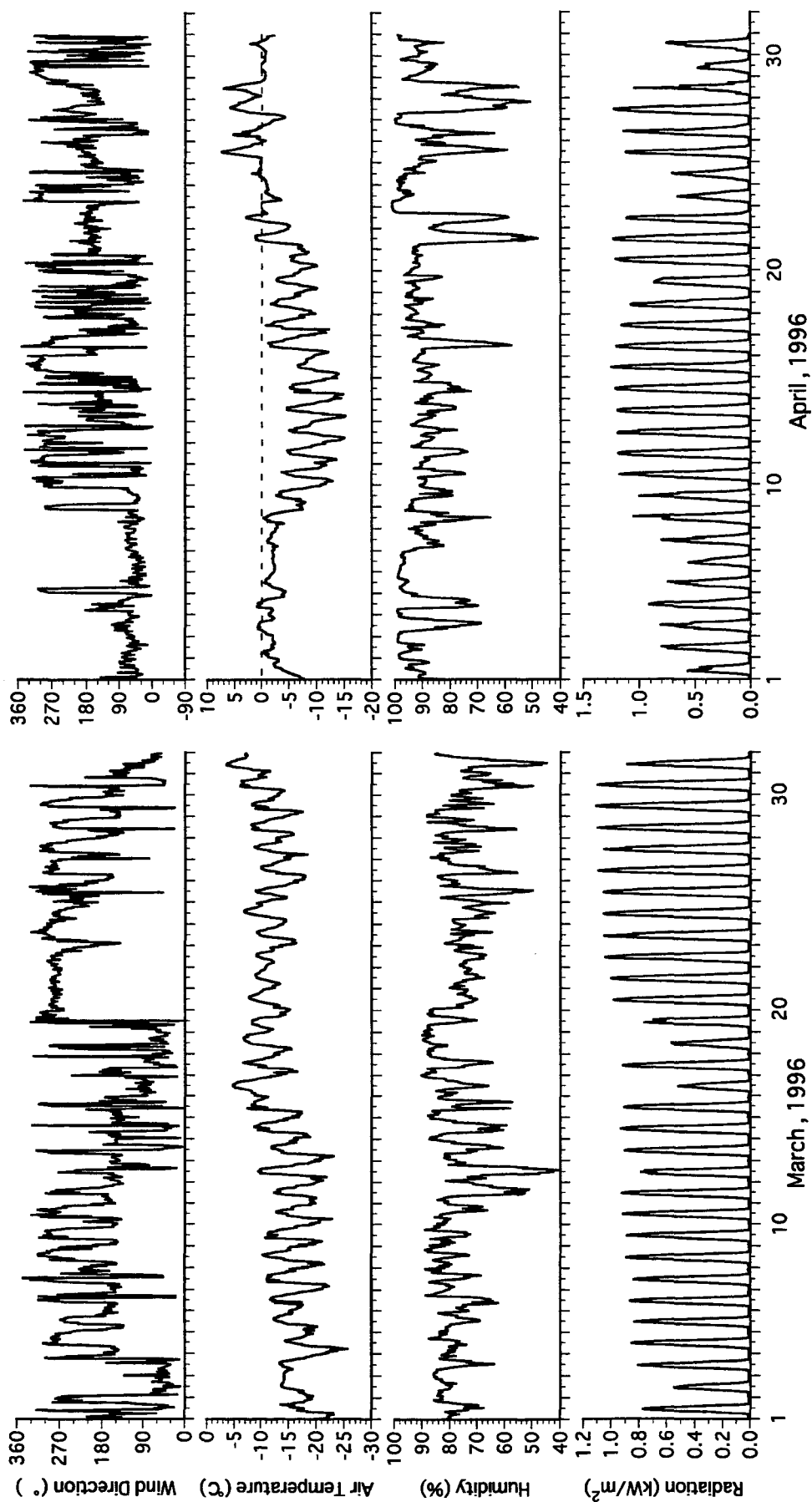
Fig. 7 Time series records of meteorological variables for each month during the period from August 1995 to August 1998.



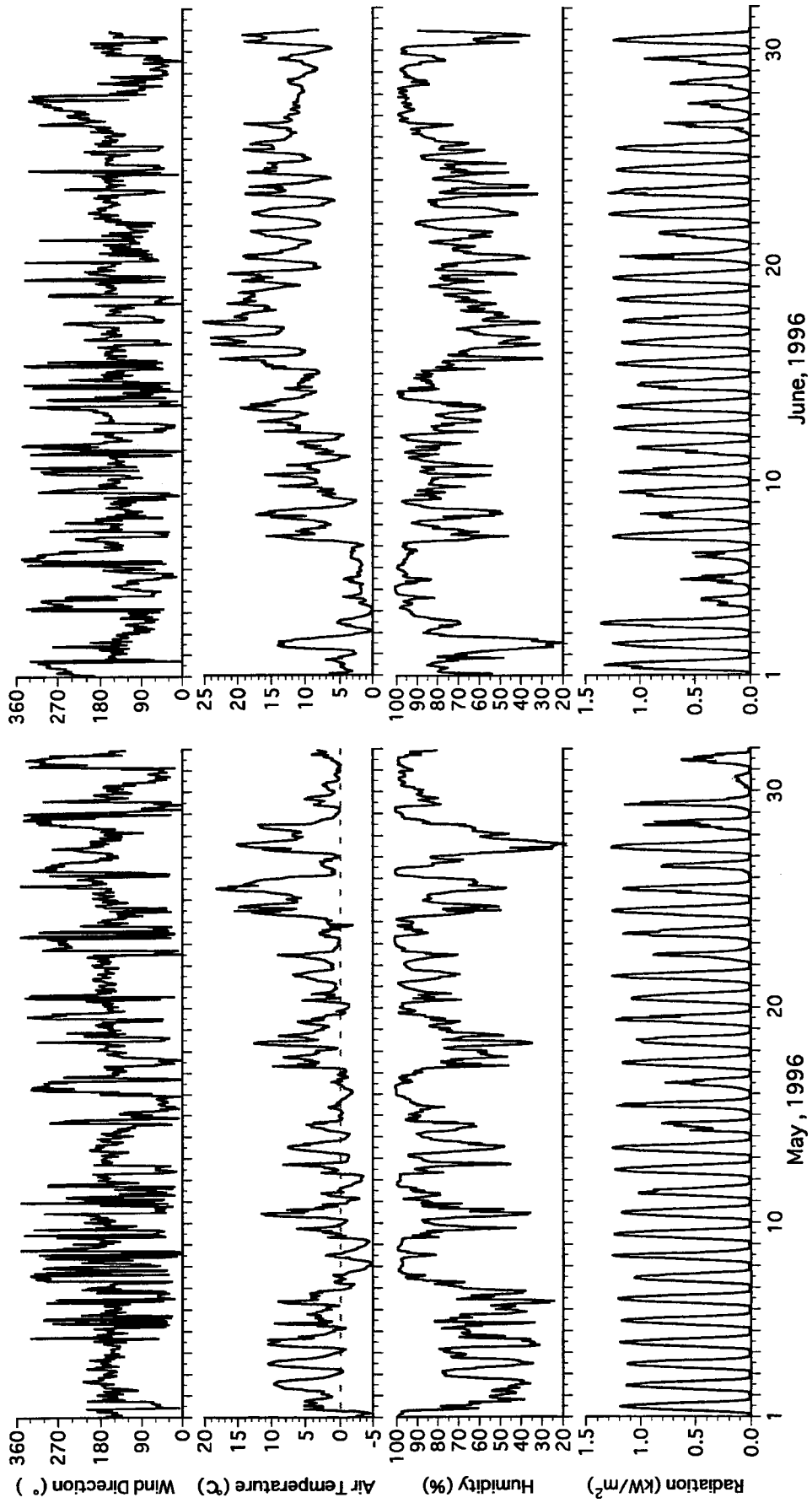




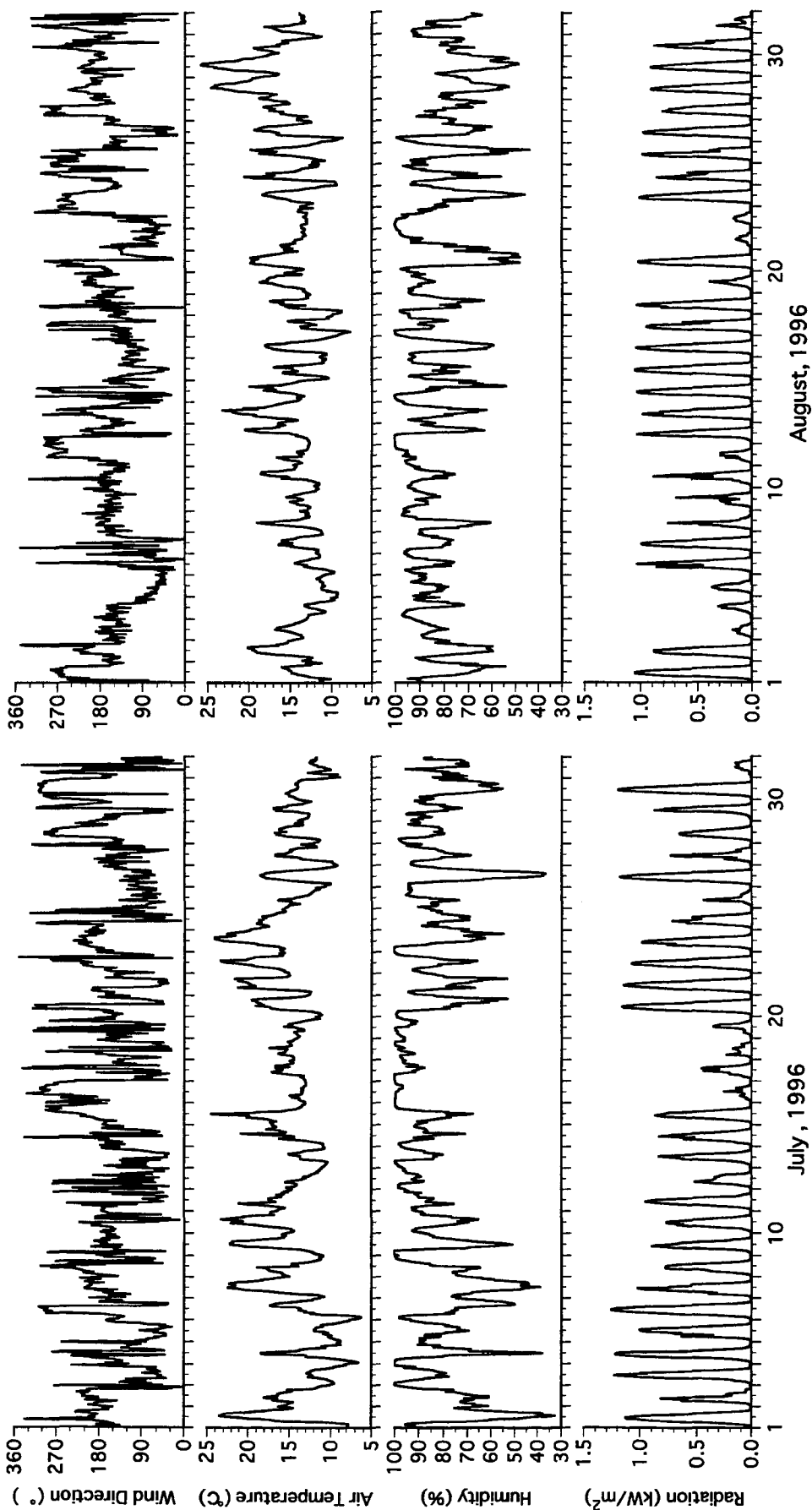
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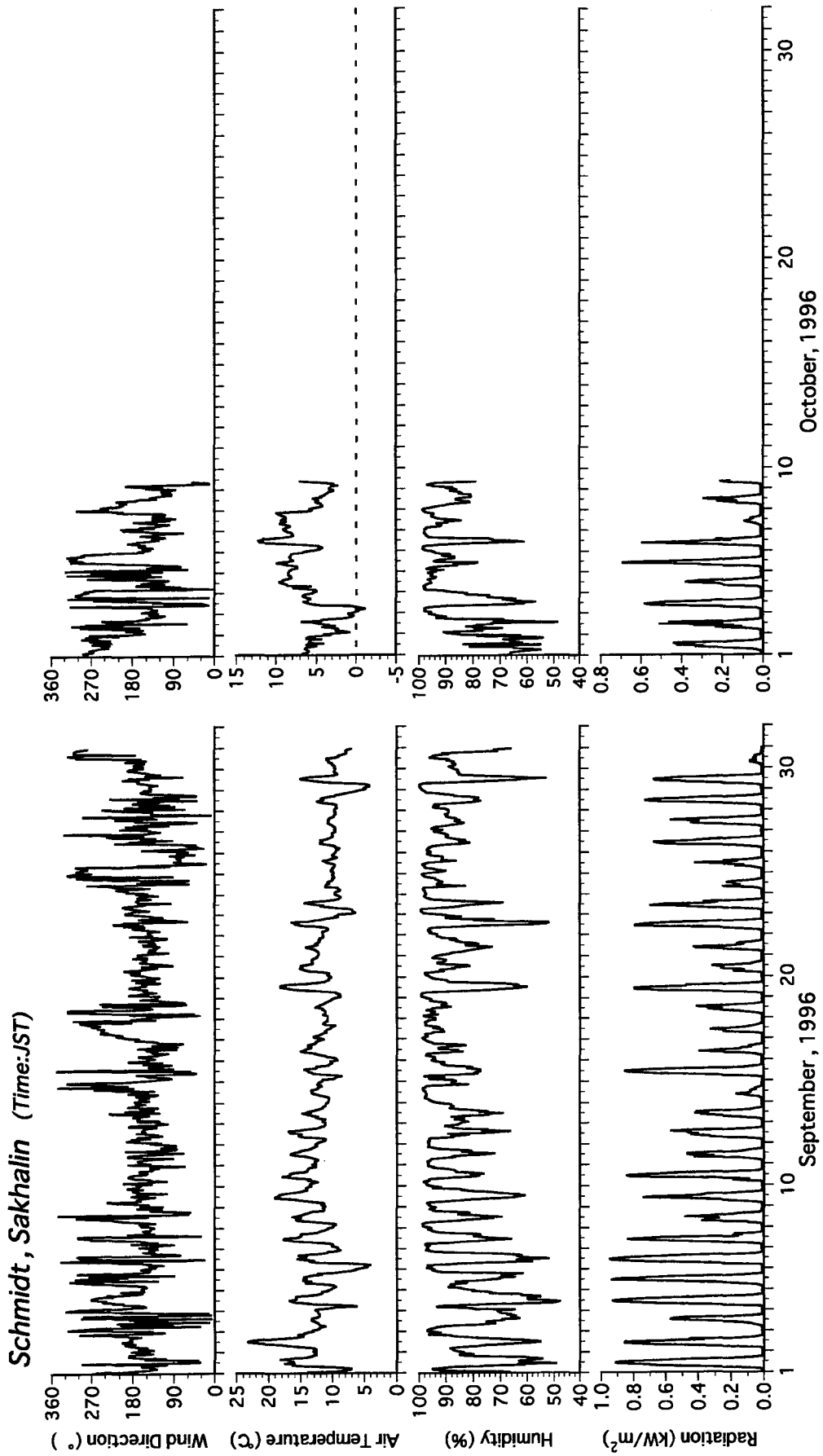


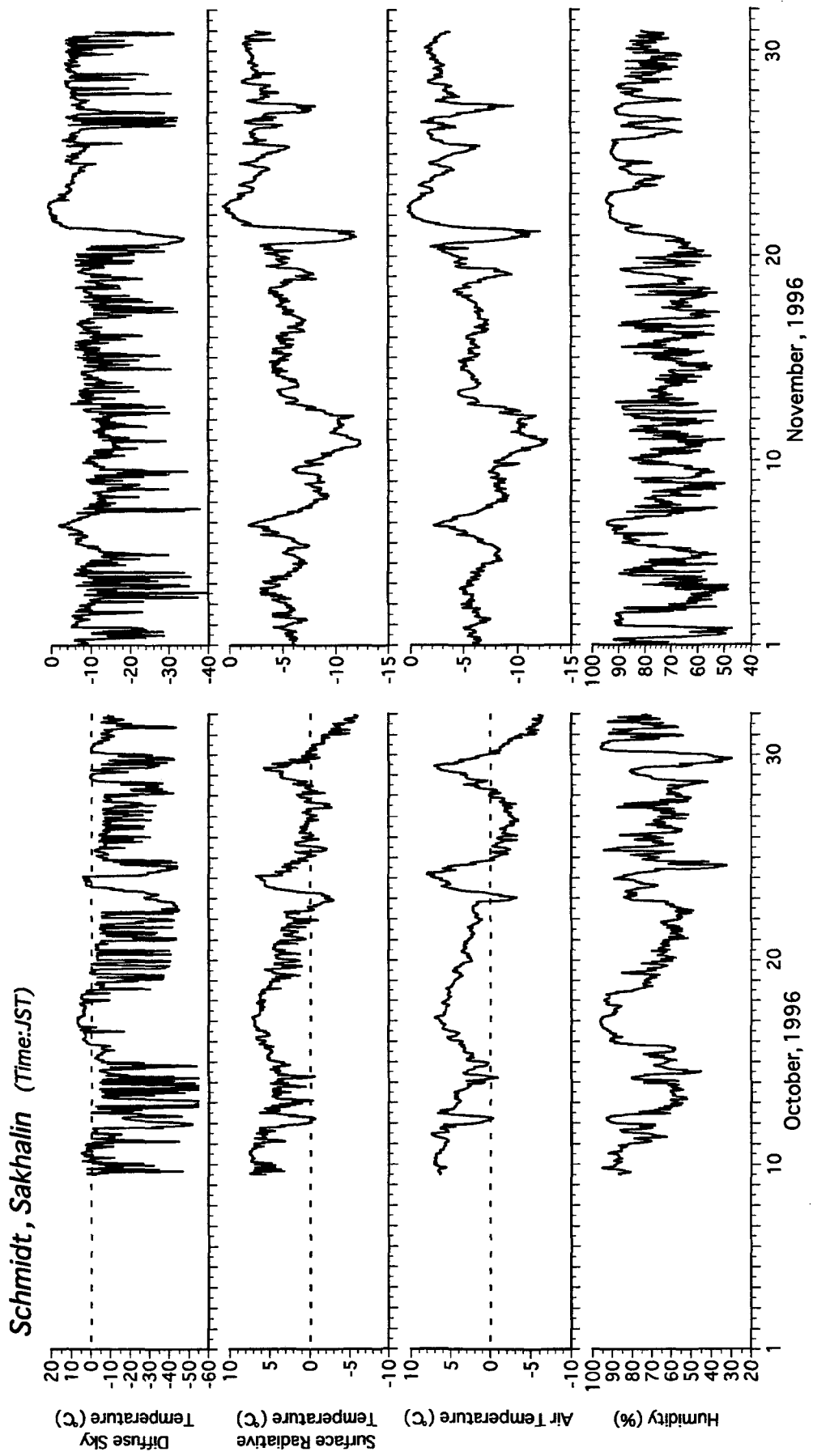
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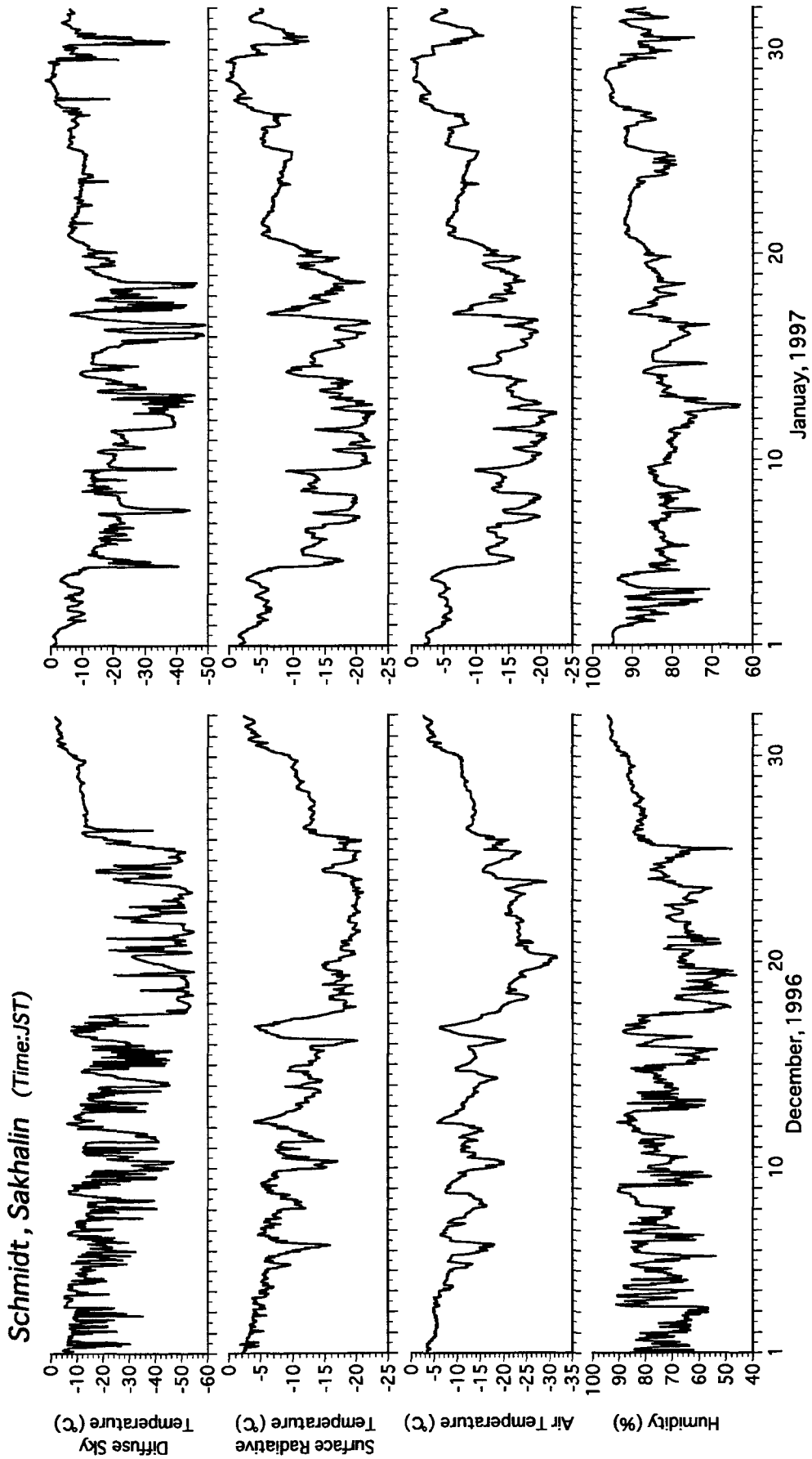


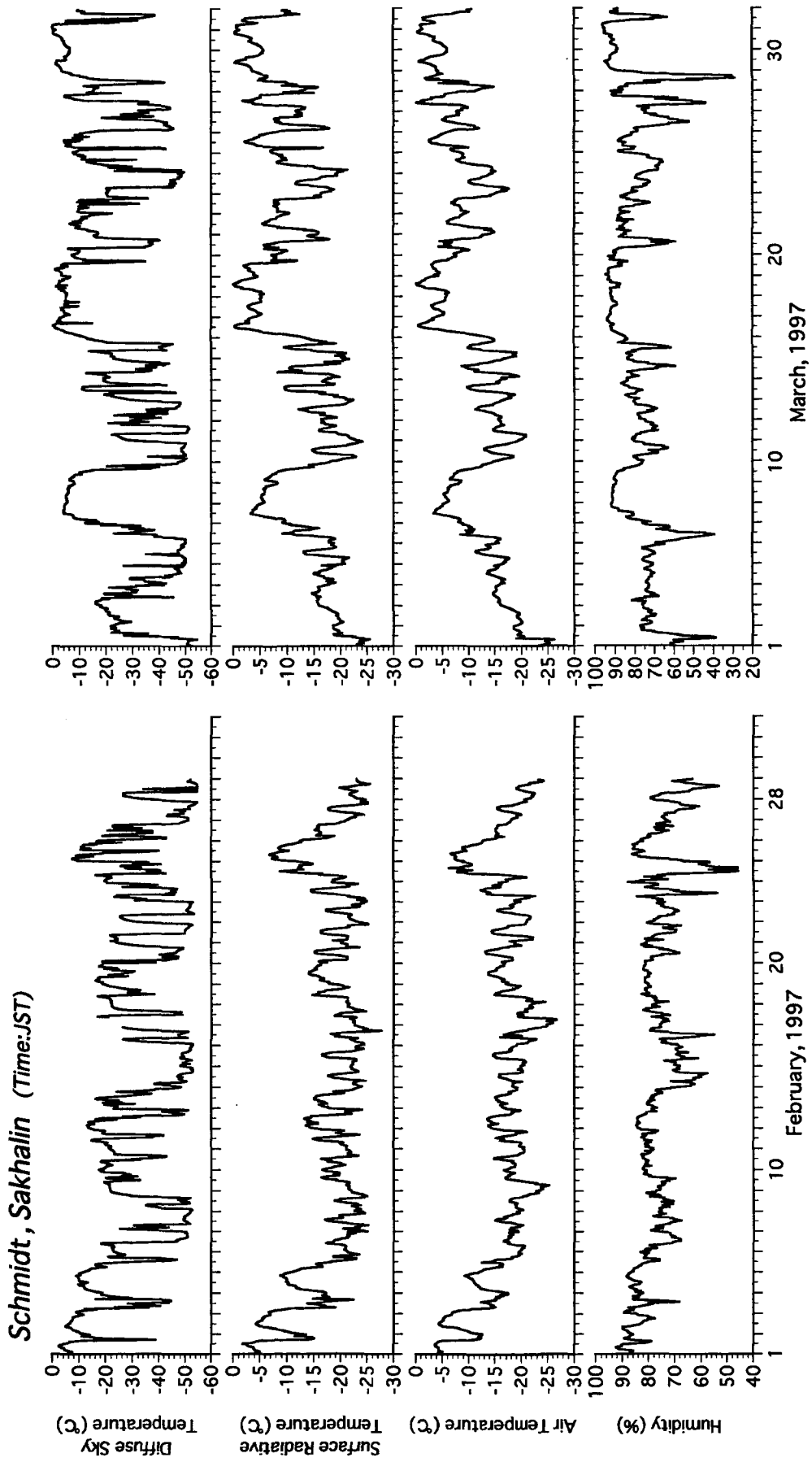
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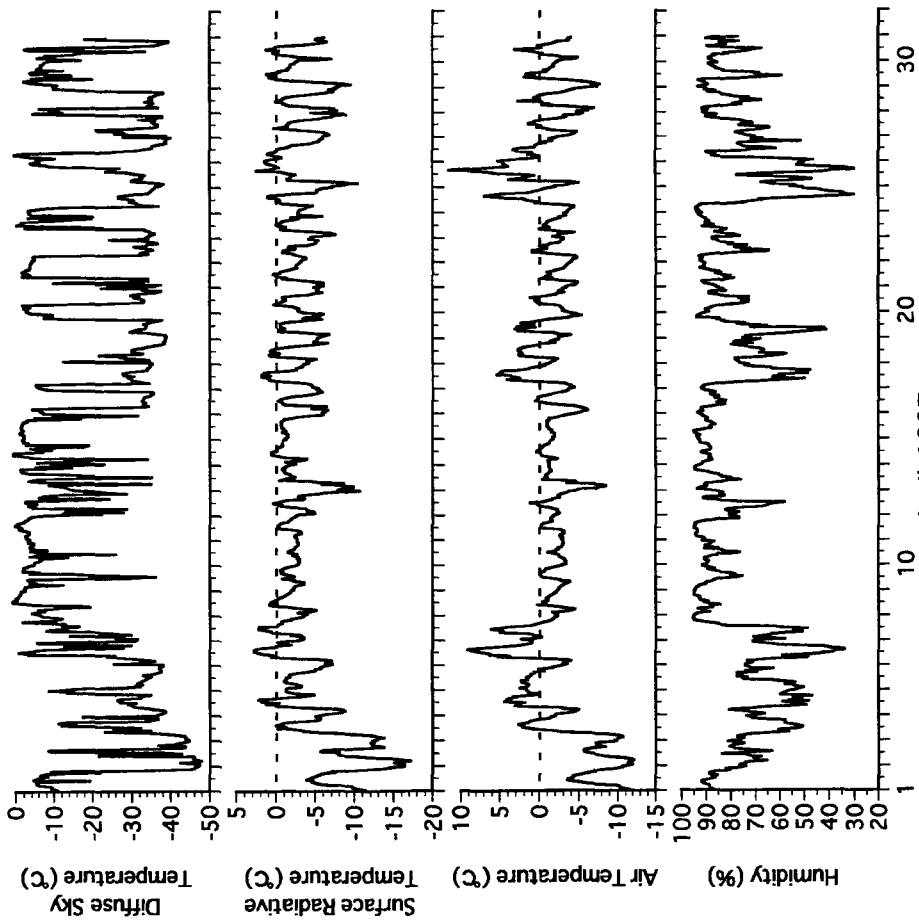




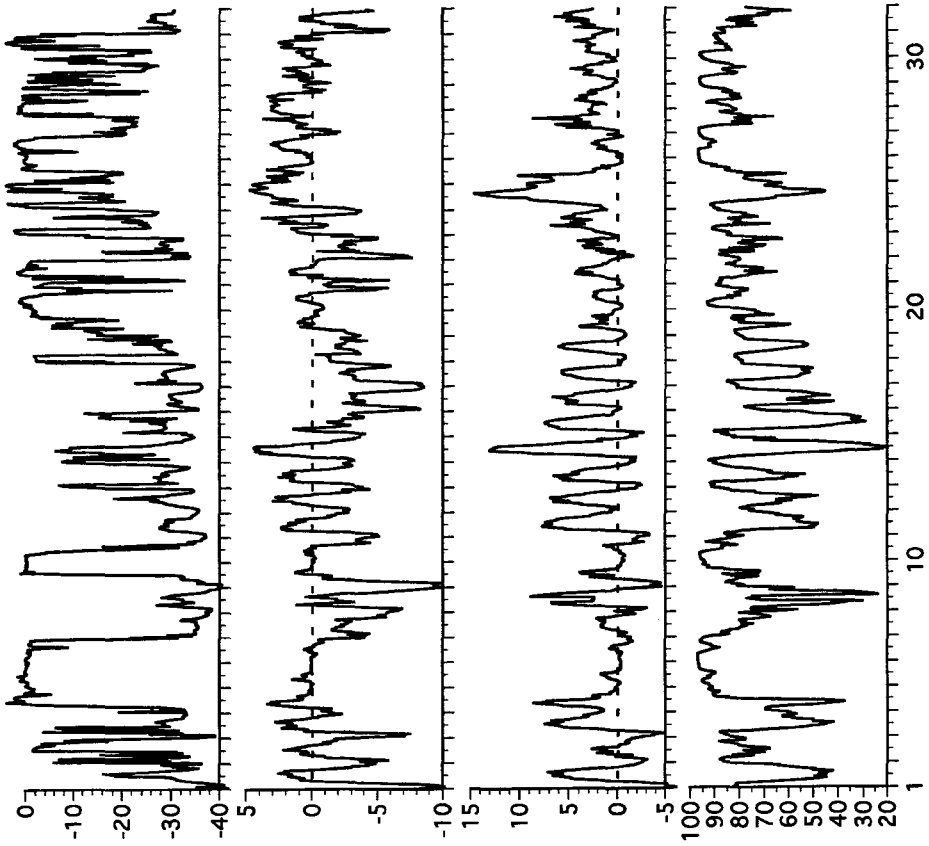




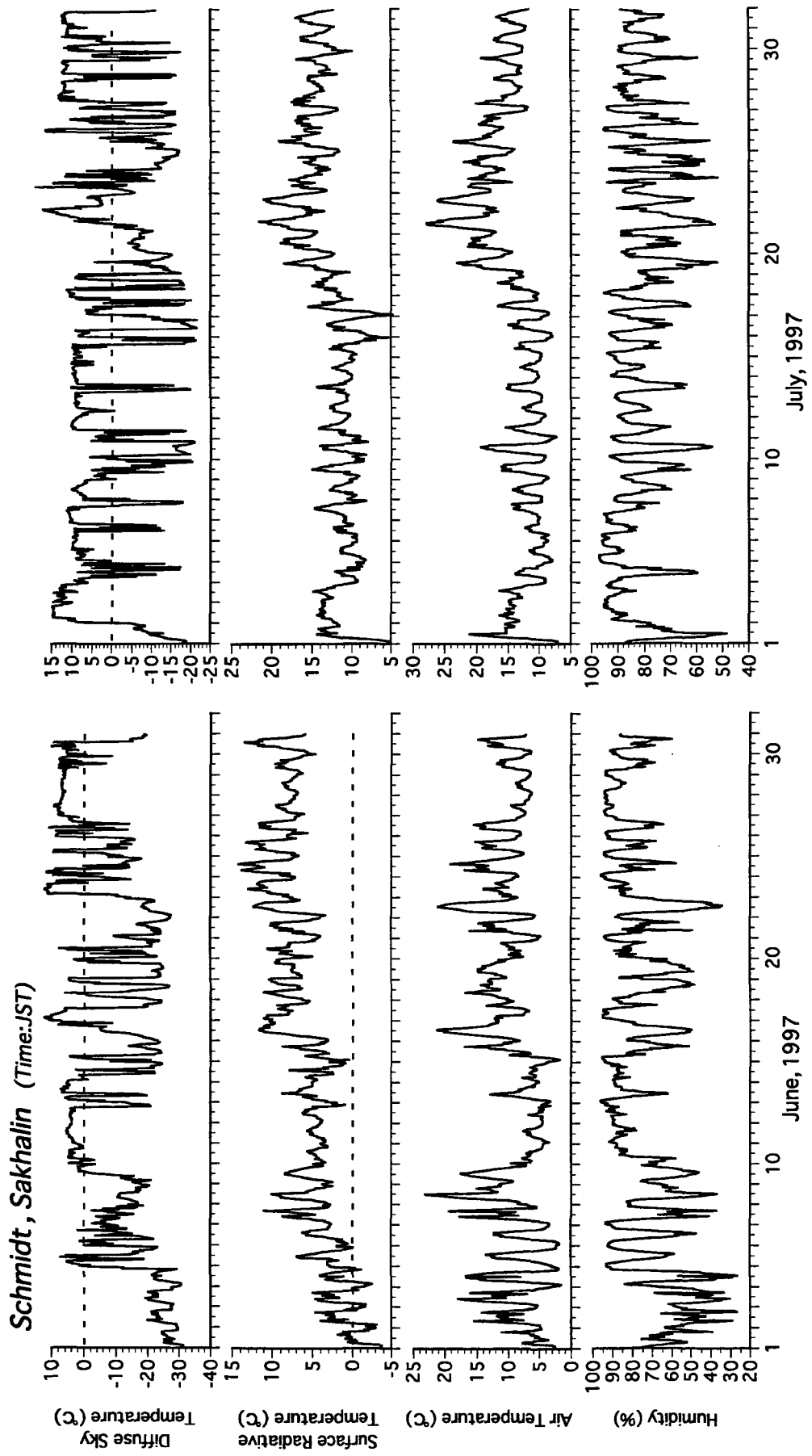
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