

THE PLANETARY WAVES DYNAMICS AND INTERANNUAL COURSE OF METEOROLOGICAL PARAMETERS OF THE HIGH LATITUDE STRATOSPHERE AND MESOSPHERE OF THE NORTHERN AND SOUTHERN HEMISPHERES DURING THE 20th AND 21st SOLAR CYCLES AND DIFFERENT PHASES OF QBO

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The part of energy of the planetary waves which enters the stratosphere depends on conditions of planetary wave generation and propagation through the tropopause, and the part of planetary wave energy which enters the mesosphere depends on conditions of planetary wave propagation through the stratopause. In this report an attempt is made to estimate connections between extratropical middle atmosphere temperature long-term variations and portions of energy of planetary waves which enter the mesosphere and stratosphere during winter seasons in Northern and Southern Hemispheres. Interannual variations of temperatures at the 30 km and 70 km levels are investigated for the central winter months of the period 1970-1986. This period includes the descending branch of the 20th solar cycle and the whole 21st cycle. Calculations are made on the basis of measurements at Heiss Island and Molodezhnaya.

Figure 1 shows interannual temperature courses at heights of 30 km and 70 km over Heiss Island and Molodezhnaya for the central winter months (January and July respectively) during the 1971-1986 period. It can be seen that interannual variations of the mesospheric and stratospheric temperatures are out-of-phase. The long-term variations of temperatures with periods of about 10 years are more visible in the mesosphere. In the northern hemisphere these oscillations are superimposed by oscillations with shorter periods, which may be connected with interannual variations in intensities of stratospheric warmings.

Monthly mean temperatures at 70 km level for central winter months over Molodezhnaya and Heiss Island for west (W) and east (E) phases of QBO for 1970-1976, 1977-1986 and 1970-1986 periods are shown in the Table:

	1970-1976		1977-1986		1970-1986	
	W	E	W	E	W	E
Heiss Isl.	199	190	216	209	207	202
Molodezhnaya	209	210	225	213	219	212

It can be seen that the east phase of QBO is followed by lower mesospheric temperatures.

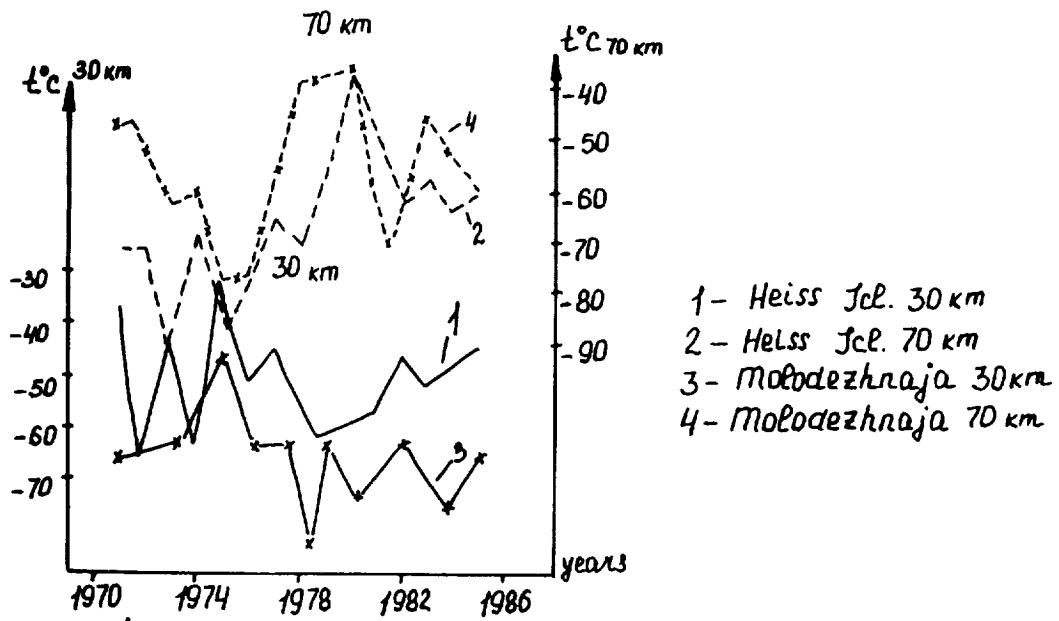


Fig. 1 Interannual courses of temperatures at 30 km and 70 km levels over Heiss Is. (Januarys) and Molodezhnaja (Julyes) for 1970-1986 period.