

Space Studies of the Upper Atmospheres of the Earth and Planets including Reference Atmospheres (C)

Advances in Remote Sensing of the Middle and Upper Atmosphere and Ionosphere from Ground and from Space, including Sounding Rockets and Multi-Instrument Studies (C0.2)

HEIGHT-LATITUDE STRUCTURE OF THE HAYASHI WAVES IN THE NORTHERN STRATOSPHERE AND LOWER MESOSPHERE IN WINTER

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By using the winter (from November to March) ERA-Interim reanalysis geopotential, temperature, zonal and meridional wind data in the troposphere, stratosphere and lower mesosphere (up to the 0.1 hPa isobaric level) for 1979-2016, an analysis of the Hayashi spectra for wave disturbances with zonal wave numbers $1 \leq k \leq 10$ and with periods from 2 to 156 days is performed. In this, contributions of the eastward traveling (E), westward traveling (W), propagating (P), stationary (S) and total (T) waves are estimated. The climatological spatial-temporal distributions Hayashi waves are integrated by wave number and frequency. As a result, were received integrated height-latitude distributions of waves E, W, P, S and T. It has been established that magnitude of wave energy for geopotential, zonal and meridional wind has two peaks: in the upper stratosphere - lower mesosphere and in the area of the tropopause. For temperature one peak also occurs in the upper stratosphere, and the lower maximum divided by tropopause on two parts: above and below the tropopause. The resulting empirical model of the height-latitude distributions of wave characteristics can be a contribution to the COSPAR International Reference Atmosphere (CIRA).