

Climatology of gravity waves in the mesosphere observed with the MU radar Climatology of gravity waves in the mesosphere observed with the MU radar

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The MU radar at Shigaraki, Japan has been operating periodically since 1986 and the extensive data set provides a unique opportunity to study the seasonal variations of gravity waves. The data has recently been made available publicly to the scientific community through a link in a large meta-database called IUGONET (Inter-university Upper atmosphere Global Observation NETwork). In our study we focus on gravity waves observed during daylight hours between 60 and 97 km. Several days of observations were made during most months during the 29 years of operation. We calculate the vertical fluxes of horizontal momentum and quantify the statistical characteristics and temporal variability of the waves. The spatial scales and intrinsic wave properties are determined, as well as their response to seasonal changes in the background conditions. The background conditions considered include changes in the mean horizontal winds and the atmospheric static stability. This study differs from those done previously in that we make extensive use of probability distribution functions as a complement to spectral analysis.

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