



Does the Madden-Julian Oscillation Modulate Stratospheric Gravity Waves?

Andrew Moss, Corwin Wright, and Nicholas Mitchell

Centre for Space, Atmospheric and Oceanic Science, University of Bath, U.K. (a.moss@bath.ac.uk)

The circulation of the stratosphere is strongly influenced by the fluxes of gravity waves propagating from tropospheric sources. In the tropics, these gravity waves are primarily generated by convection. The Madden-Julian Oscillation (MJO) dominates the intra-seasonal variability of this convection. However, the connection between the MJO and the variability of stratospheric gravity waves is largely unknown. Here we examine gravity-wave potential energy at a height of 26 km and the upper tropospheric zonal-wind anomaly of the MJO at the 200 hPa level, sorted by the relative phase of the MJO using the RMM MJO indices. We show that a strong anti-correlation exists between gravity-wave potential energy and the MJO eastward wind anomaly. We propose that this correlation is a result of the filtering of ascending waves by the MJO winds. The study provides evidence that the MJO contributes significantly to the variability of stratospheric gravity waves in the tropics.