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Mesopause gravity wave momentum flux variability and its relation to interhemispheric coupling

Rosmarie de Wit (1), Diego Janches (1), Dave Fritts (2), Robert Hibbins (3,4)

(1) NASA Goddard Space Flight Center, Greenbelt, Maryland, United States, (2) GATS inc, Boulder, Colorado, United States, (3) Norwegian University of Science and Technology, Trondheim, Norway, (4) Birkeland Centre for Space Science, Bergen, Norway

The Southern Argentina Agile MEteor Radar (SAAMER), located at southern midlatitudes (54°S) and specifically designed to measure mesosphere/lower thermosphere (MLT) gravity wave momentum flux, has been providing near-continuous measurements since May 2008. Taking advantage of more than 7 years of observations, the interannual variability of the gravity wave momentum flux is studied. A quasi-biennial modulation, with periods similar to that of the equatorial stratospheric quasi-biennial oscillation (QBO) is observed. This QBO signal is found to be largest during southern hemisphere summer, and in-phase with the stratospheric QBO at 50 hPa. The relation between the stratospheric QBO and the QBO modulation in the MLT gravity wave forcing (derived from the divergence of the momentum flux) was found to be consistent with that expected from the Holton-Tan effect coupled to the interhemispheric coupling mechanism, and provides the first observational support for the existence of the midlatitude gravity wave forcing anomalies as hypothesized in the interhemispheric coupling mechanism.