



Global Gravity Wave Momentum Flux Determination from Triads of GPS Radio Occultation Profiles

Antonia Faber (1), Pablo Llamedo (2), Torsten Schmidt (1), Alejandro de la Torre (2), Jens Wickert (1), and Stefan Heise (1)

(1) GFZ German Research Centre for Geosciences, 1, Potsdam, Germany (antonia.faber@gfz-potsdam.de), (2) Facultad de Ingeniería, Universidad Austral, Buenos Aires, Argentina.

The GPS Radio Occultation technique (RO) is a well-established technique for obtaining global gravity wave (GW) information from temperature profiles. RO uses GPS signals received aboard low Earth orbiting satellites for atmospheric limb sounding. Temperature profiles are derived with high resolution and provide a global coverage under any weather conditions offering the possibility for global monitoring of the temperature structure and wave parameters. The six satellites constellation COSMIC/FORMOSAT-3 delivers approximately 1800 temperature profiles daily. In this study, we derive global distributions of vertical and horizontal save numbers and wave potential energy, needed to compute the momentum flux. The horizontal wavenumber kh is derived by the ratio of the phase shift $\Delta [U+03D5]_{ij}$ and the spatial distance Δx_{ij} between the regarded profiles at a given altitude ($kh = \Delta [U+03D5]_{ij}/\Delta x_{ij}$). To extract the horizontal wavelength along the wave propagation direction, a third measurement is needed. These triads must be close in time and space. The horizontal and vertical wavelength, the specific potential energy (Ep), the vertical flux of horizontal momentum (MF) is calculated and possible trends are discussed. The horizontal wavelength distribution shows results between 2000 and 3000 km with larger wavelength toward the equator and on the winter hemisphere. Global analysis including seasonal mean results of vertical wavelength and potential energy in an altitude range of 20 to 30 km are discussed, too.