



New approach of gravity wave detection in mesopause temperatures operating an array of airglow spectrometers

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GRIPS (Ground based Infrared P-branch Spectrometer) airglow measurements allow the derivation of kinetic temperature in the mesopause region averaged over a field of view of some 10km x 10km. In 2011, three identical GRIPS instruments were setup at Oberpfaffenhofen (11.28°E, 48.09°N), Germany, in a way that their fields of view form an equilateral triangle shape in the mesopause with a horizontal dimension of approximately 70km. Using this setup, GRIPS time series cannot only be analyzed with respect to gravity wave periods, but also spatial wave parameters can be derived.

Based on the results of the harmonic analysis the horizontal wavelength, phase speed and the direction of propagation were determined for gravity wave events from February to July 2011. We present distinct relationships between periods, amplitudes, phase speeds and wavelengths, which were identified in this dataset. Further data analysis of the derived wave parameters show preferred directions of propagation and suggest seasonal variations of the wave characteristics.

The presentation will be concluded by the introduction of a measurement setup relying on one GRIPS instrument which is equipped with a variably adjustable mirror optic. The capability to scan multiple fields of view during nightly measurements will offer longer-term investigations of mesopause gravity waves.