Geophysical Research Abstracts
Vol. 17, EGU2015-14680, 2015
EGU General Assembly 2015

First results from a high-speed infrared imaging system for the observation of gravity waves in OH airglow

Michael Bittner (1,2), Patrick Hannawald (2), Carsten Schmidt (1), and Sabine Wüst (1)

(1) German Aerospace Center, DLR Oberpfaffenhofen, DFD-ATM, Wessling, Germany , (2) University Augsburg, Physics Department, Augsburg, Germany

The OH-airglow-layer is concentrated at a height of about 87 km with a half-width of approximately 3 km. Observing the infrared emissions of the vibrational-rotational excited OH moelcules offers a unique possibility for studying atmospheric dynamics. Especially, atmospheric gravity waves are prominent features in the measurements.

Since December 2013 the new imaging system FAIm (Fast Infrared Imager) for the study of smaller-scale features (both in space and time)is operational at the NDMC (Network for the Detection of Mesospheric Change, http://wdc.dlr.de/ndmc)station Oberpfaffenhofen.

Covering the brightest OH vibrational bands between 1.3 and 1.7micrometer, the imaging system can acquire
2 frames per second. The field of view is approximately 50 km x 60 km at the mesopause height with a mean spatial resolution of 200 m. More than 370 nights of observation have successfully been performed already. The observations show a large variety of atmospheric waves with horizontal wavelengths down to less than 3km, different directions of propagation and phase velocities varying from nearly 0 m/s (quasi stationary waves) to more than 50 m/s.

We present the experimental setup and will show first results. Especially, spatio-temporal sequences of the
generation of smaller scale gravity wave fields as well as their turbulent dissipation will be shown.

An outlook will be given to planned future simultaneous measurements from different stations in the alpine region in order to achieve some stereoscopic information about gravity wave fields.