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Gravity wave amplitudes changes observed in different airglow emissions: influence of wave breaking and observational selection

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

(1) German Aerospace Center (DLR), German Remote Sensing Data Center (DFD), Wessling, Germany (carsten.schmidt@dlr.de), (2) University of Augsburg, Germany

The upper mesosphere lower thermosphere region is well known for enhanced gravity wave breaking. Airglow emissions originating in this height region provide a good possibility for detailed studies of gravity wave behavior in this altitude.
Therefore, rotational temperatures and intensities of the OH(3-1), OH(4-2), OH(6-2) and O_2b(0-1)-transitions recorded at the NDMC (Network for the Detection of Mesospheric Change) site Oberpfaffenhofen (48.1°N, 10.3°E), Germany are examined.
First results indicate, that both significant amplitude growth from the lower (∼87km) OH airglow emissions to the higher (∼95km) O_2 airglow emissions of more than 100% as well as strong damping can be observed. On several occasions OH- and O_2-emissions show completely independent behavior – probably related to the complete breakup of a gravity wave.
These amplitude changes are set into relation to emission layer height, vertical wavelength, absolute temperature and potential seasonal dependence. Observations from further NDMC sites in France, Germany and Austria are used to discuss the evolution of these waves on horizontal scales from 100km to 1000km.