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# Infrasonic signatures due to severe weather in mesopause airglow observations

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Pressure fluctuations due to atmospheric waves (infrasound, gravity waves) correspond to temperature fluctuations in the atmosphere via ideal gas law assumptions. The observation of temperatures in the mesopause altitude region ($\sim$80-100 km) is performed at the German Aerospace Center / German Remote Sensing Data Center (DLR-DFD) using GRIPS airglow spectrometers (Ground-based Infrared P-branch Spectrometers). Small fluctuations of e.g. surface or tropospheric sources of infrasound and gravity waves increase with height due to the decreasing background pressure in the atmosphere.

Detections of long-period infrasound and short-period gravity wave signatures in the mesopause with periods between 1 and 10 minutes are investigated in airglow data from different GRIPS instruments, observation sites and seasons using wavelet spectral analysis. This period range is adequate for wave propagation from ground to thermosphere with little attenuation; it is also one of the main period ranges for wave signatures of meteorological origin. The observed signatures are compared to intervals of increased CAPE (convective available potential energy) near the instruments field of view and thereby associated to potential infrasound and gravity wave sources of meteorological origin like severe weather and thunderstorms.