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Effects of fine-scale orography on infrasound propagation

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The sensitivity of infrasound propagation to reflections by a non-flat surface is investigated within this study. Infrasound propagation modelling is performed at the German Remote Sensing Data Center of the German Aerospace Center (DLR-DFD) using improved 3d ray-tracing methods (HARPA/DLR). Terrain information is newly included in the modelling using a high-resolution digital surface model.
The SRTM30-PLUS digital surface model incorporates the DLR "Shuttle Radar Topography Mission" and complementary surface information to generate a global, equidistant and complete data set for surface orography. The maximum horizontal resolution is 30 arc seconds (about 1km), the maximum vertical resolution is 1m. The resolution of the model can be adapted to the wavelength of the considered infrasound signal. The orography is implemented as background data using bicubic spline interpolation and thus provides smooth surface layer information for infrasound propagation modelling.
First modelling cases containing the European Alps region show that orography has a significant influence on infrasound propagation. Ducts and propagation patterns can be veritably changed according to reflection by non-flat fine-scale orography. First results on the sensitivity of infrasound propagation to surface orography will be presented.