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# propagation simulations using atmospheric fields from high-resolution global models resolving gravity waves

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Small-scale atmospheric perturbations known as gravity waves (GW) are critical to infrasound propagation simulations as they alter the propagation path of the waves, causing detections at infrasound stations that remain unexplained when only large scale atmospheric features are considered. Therefore, it is important to investigate ways of accounting for these perturbations in the atmospheric fields prescribed in propagation models. Here, we use modelled atmospheric fields obtained in the framework of the Dynamics of the Atmospheric General Circulation Modeled on Nonhydrostatic Domains (DYAMOND) project. This international project, initiated by the Max Planck Institute for Meteorology (MPIM) and the University of Tokyo, describes a framework for the intercomparison of high-resolution global atmospheric models. It mainly focuses on tropospheric weather, but some models were run with a high enough top so that GW are resolved up to the stratosphere. Starting with different configurations of the Icosahedral Non-hydrostatic (ICON) model, we explore how differences in infrasound-related parameters (azimuth deviation, shadow zone, celerity) derived using a ray-tracing tool relate to differences in the resolved tropospheric and stratospheric wind and temperature fields. Lidar observations are used to assess the modelled fields and to bring ground-truth atmospheric specification for infrasound propagation simulations.

## Promotional text

The verification regime of the Comprehensive Nuclear-Test-Ban Treaty requires to use the best possible tools to detect and analyse events of interest. Using infrasound observations for analysis demands very good knowledge of the middle atmosphere and its small-scale dynamics.

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