



Estimation of upper atmospheric wind model updates using infrasound data

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In this study, we revisit the inverse problem of estimating upper atmospheric wind model updates, using a priori wind models and infrasound data. Such wind model updates may be useful in reducing uncertainty in the knowledge of wind speed models in the region above the stratopause, as atmospheric specifications in this region are predominantly described by semi-empirical climatologies. Hence, estimation of wind model updates is relevant in the context of the Atmospheric Dynamics InfraStructure in Europe (ARISE) project. Moreover, wind model updates are useful in the context of other infrasound applications, such as the estimation of explosion yield from thermospheric arrivals.

In this study, we present further developments of infrasound inversion methodologies. We focus on the use of linearized methods, global optimization methods and an exhaustive search, applied to multi-receiver datasets, to study the simultaneous estimation of zonal and meridional wind model updates in the mesosphere and lower thermosphere, including the associated uncertainties.