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# The influence of mesoscale atmospheric convection on local and regional infrasound propagation

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Infrasound can propagate over a variety of spatiotemporal ranges and is therefore affected by spatiotemporally diverse atmospheric conditions. However, studies of the influence of meteorology on infrasound propagation have historically utilized weather data that rely on point sources or coarser spatiotemporal resolutions, which often gloss over the effects of mesoscale meteorological phenomena. In light of this knowledge gap, this study examines the influence of mesoscale meteorological features on infrasound propagation on local and regional scales. To accomplish this task, output from simulations using the Weather Research and Forecasting (WRF) meteorological model is fed into an infrasound propagation model to generate infrasound predictions using realistic meteorological conditions. The WRF simulations covered a range of horizontal resolutions – from 1 to 15 km – enabling an analysis of the sensitivity of the infrasound predictions to the horizontal resolution of the WRF output. The main result is that convective precipitation events can appreciably alter the transmission loss patterns emanating from infrasonic sources, which is especially evident at finer horizontal resolutions. This demonstrates that high-resolution weather data may be necessary to correctly simulate local to regional infrasound propagation, especially within warm-season, convective environments.

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