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Statistical Framework for Estimating Atmospheric Winds using Continuous Infrasound

Infrasonic energy is known to propagate into the upper atmosphere before returning to the ground surface. A number of researchers have shown that transient infrasonic signals observed at spatially separated points can be used to estimate characteristics of the atmospheric winds. A statistical framework will be presented to demonstrate the extension of such methods to continuous infrasonic signals. Using this formulation, the inversion can be applied to a number of types of infrasonic "noise" such as microbaroms and wind farm infrasound to continuously monitor variations in the local atmospheric winds. The primary limitations of the application to such an approach are due to 1) the precision to which ground-to-ground propagation times can be identified and 2) the level of complexity allowed in the atmospheric model. The second of these concerns will be discussed in detail and compared with current atmosphere inversion methods and results.

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