

-Acoustic Coupled Signals - Epicentral and Secondary Sources of Infrasound

A sequence of moderate and strong earthquakes is recorded by infrasound arrays up to an epicentral distance of 750 km. Two distinct signals originating at the earthquake source are detected; (1) Seismic, consisting of body and surface phases, and (2) Infrasound. However, using array processing, a third type of signal can sometimes be detected. This signal arrives after the seismic detections and before the epicentral infrasound detections with a celerity of ~ 1 km/s to 460 m/s. This intermediate signal, as the epicentral infrasound signal, traverses the array with a trace velocity of roughly 350 m/s. Relative to the epicentral infrasound detections, which exhibit a stable back-azimuth pointing toward the epicenter, the intermediate signal detections are scattered with $\pm 30^\circ$. The trace velocity of the intermediate signal indicates that it is infrasound but the celerity is too fast for it to originate at the epicenter. Therefore, this intermediate infrasound signal must have a propagation path which is part seismic and part atmospheric. We show that the manifestation of an intermediate, apparently fast-arriving infrasound signal occurs when ground motions are efficiently coupled to an existing atmospheric duct to the infrasound array.

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