



Extraction of low frequency signals from cross-correlations of the infrasonic ambient noise

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Cross-correlation of ambient noise are widely used in seismology for imaging and monitoring purposes. The underlying result is the possibility to extract the Green Function between two locations on the Earth by correlating the noise recorded at these two points during long period of time. However, the applicability of this approach in atmospheric infrasound is not yet well established.

We present cross-correlations of the infrasonic dataset of the USArray for the year 2012 filtered between 3 and 330 seconds. All cross-correlations were computed daily with a moving window of 3 hours. Only the amplitude normalization has been applied. We observe clear signals on the stacked cross-correlations for inter-station distances smaller than 400 km. The dominant period of this signal is around 60-100 s and its propagation velocity is approximately 320 m/s. We then use the daily cross-correlations to get information on the location of corresponding noise sources. Daily cross-correlations are asymmetric and show seasonal variations. These observations are due to the inhomogeneous noise sources distribution that can be inferred from a beamforming analysis. Our results show the seasonal variations of the back-azimuth of dominant infrasound noise sources generating this low frequency signal. This is a new opportunity to characterize the composition of the infrasonic ambient noise and to promote the application of passive approaches in atmospheric infrasound.