

the presence of tonal noise in infrasound records

Industrial activity has a significant impact in the local and regional seismic-acoustic wavefield. The repetitive nature of industrial processes generates persistent elastic energy that can be observed at distances of several 10's of kilometers. The signature of this activity is observed as a mixture of both broadband and tonal noise (TN) in seismic and acoustic/infrasonic records. TN is generated by machines with rotating parts and is often characterized by sharp spectral peaks at the frequency of rotation and its integer harmonics. For example, large modern wind turbines (power > 1 megawatt) can produce TN with fundamental frequencies between 0.5 and 3 Hz. We are developing an algorithm for the detection and localization of TN. This detector operates in three steps: (1) temporal normalization to prevent the interference of transient signals, (2) estimation of the power spectral density and peak identification, and (3) peak categorization within TN sequences. We are testing the performance of the detector using infrasound stations of the International Monitoring System. The identification and characterization of TN (e. g.: number of TN sequences, fundamental frequencies, and number of harmonics) in infrasonic records can provide information to reduce its potential effects in the performance of sensor arrays.

Primary author: MARCILLO, Omar (Los Alamos National Laboratory)

Presenter: MARCILLO, Omar (Los Alamos National Laboratory)

Track Classification: Data Processing and Station Performance