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T1.1-P01. A Comparative Study of Automated Infrasound Detectors using Infrasound Sensors and Single Seismic Stations

Development of optimal infrasound signal detection procedures needs to consider signal characteristics. We investigate the performance of automated infrasound detectors on impulsive and extended signals. In the first case, waveforms recorded by the Korean infrasound array CHNAR are analyzed using the progressive multi-channel correlation method (Cansi, 1995) and the adaptive F detector (Arrowsmith et al., 2009). The automated techniques are compared to the signals identified by five independent analysts. The effectiveness of the detector is shown to be a function of array aperture, RMS amplitudes (1.2-4.5 mPa), and wind conditions. The detection probabilities (DP) is most strongly influenced by noise level with an average DP of ~40% under low noise condition (1. mPa) and an average of ~23% under high noise level (2.9 mPa). In the second case, we design an automatic infrasound detector using single seismic stations in the western US to analyze the signal characteristics of known impulsive and extended signals. Based on the RMS amplitude measurement of pre-group velocity windows, arrival time, SNR, and the duration of the signal were estimated. We identify key features in establishing infrasound bulletins through detector tuning at a single array as well as the effective use of a network of sensors.

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