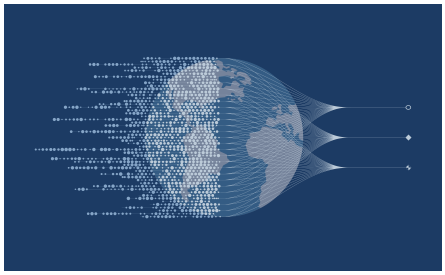

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Evaluation of Automatic Infrasound Signal Classification via Machine Learning Deployed at the Central and Eastern European Infrasound Network

Thursday 11 September 2025 11:00 (1 hour)

Infrasound monitoring usually requires ground truth information from other sources in order to classify a detection. Here, we present an ensemble model that combines a Random Forest trained on simple features derived from the Progressive Multi-Channel Correlation (PMCC) technique with a Neural Network trained on spectrograms calculated from the waveforms to overcome the necessity of ground truth information. The data originates from a subset of the Central and Eastern European Infrasound networks, including five arrays. A dataset consisting of more than 200 000 hand-labeled PMCC detections involves sources such as quarry blasts, oil refineries, industrial and war activity, thunderstorms, and eruptions of Mount Etna. Training, validation and testing were performed to identify the aforementioned classes versus detections with unknown origins. The experience of multi-month automatic infrasound monitoring is shared, focusing on both single-station and network-level processing.

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