ID: Type: **Oral**

T3.3-O3. Association of array processing and machine learning for the detection and classification of seismic events

We associate an array processing method to detect seismic events and a machine learning classification method to classify the detections. The detector is the progressive multi-channel correlation (PMCC) technique, which has been developed at the Environmental Assessment and Monitoring Department (DASE) of CEA. It is designed to detect any coherent wavefront crossing a seismometer array, and to estimate its propagation parameters. Due to coherent noise, PMCC can trigger detections that are not related to a seismic event of interest, hence the need to classify the detections. The classification method is called hidden Markov models (HMM). HMMs are trained to model feature vector sequences, which are extracted from the seismic signal, and they are used for classification. The features we choose combine features computed directly from the signal, and outputs from PMCC describing the detected wave. We apply our method to the automatic discrimination of PMCC detections between regional seismic events, teleseismic events, and noise. We use signal records from the IMS Songino array station in Mongolia, and the seismic catalogue provided by the Research Center of Astronomy and Geophysics (RCAG) of the Mongolian Academy of Sciences. The classification performance is above 80%.

Primary author: BUI QUANG, Paul (CEA)

Presenter: BUI QUANG, Paul (CEA)

Track Classification: 3. Advances in sensors, networks and processing