ID: Type: **Oral**

Classification of Extensive Aftershock Sequences Using Empirical Matched Field Processing

Aftershock sequences following large earthquakes create problems for data centers attempting to produce near real-time event bulletins. The greatly increased number of events requiring processing can overwhelm analyst resources, reducing the capacity for examining events of monitoring interest. Waveform-correlation methods have shown promise for automatically identifying groups of events belonging to the same source region, allowing the more efficient analysis of event-ensembles rather than individual events. However, signals from very large earthquakes often correlate too poorly with signals from smaller aftershocks for correlation detectors to produce statistically meaningful triggers at the correct times. Empirical Matched Field Processing (EMFP) is a quasi-frequency-domain technique that recognizes signal patterns by calibrating the spatial structure of wavefronts crossing a seismic array in a collection of narrow frequency bands. It is a highly promising method for detecting pertinent arrivals with high sensitivity and a low false alarm rate and is here demonstrated to perform exceptionally in detecting aftershocks from the 2005 Kashmir and 2011 Van earthquakes. EMFP has the potential to produce reliable triggers of aftershocks in an evolving sequence such that correlation and subspace detectors can be created automatically, with well-chosen parameter specifications, to identify and classify clusters of very closely-spaced aftershocks.

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