



Session 09

From earthquake early warning to rapid response – integrating state-of-the-art from real-time seismology and earthquake engineering

Conveners:

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In the last decade, earthquake early warning (EEW) and rapid response (RR) systems are proving to be an effective earthquake risk reduction strategy and they are being successfully deployed in high-seismic-hazard countries, such as Japan, USA, Mexico and Taiwan. In Europe, the development and testing of these systems is being investigated in several seismically-active countries, mainly along the Mediterranean region.

The next generation of EEW and RR systems will integrate new sensor technologies (e.g., high-rate GPS, near-source surface and borehole seismic arrays, fiber-optical cable sensors, super-conducting gravimeters, low-cost and smartphone-embedded accelerometers) and feature processing methods that track and image the on-going earthquake rupture and that provide increasingly accurate estimates of ground motion and earthquake impact. The innovative idea behind these new developments is to link the probabilistic decision module of an EEW system to an expert decision-support system that may avail of Artificial Intelligence methodologies to combine local and regional information and trigger automatic safety actions that mitigate the impact of the earthquake on people, sensitive equipment, and the built environment. Decision-making methods piloted by EEW alerts should account for probabilistic real-time loss prediction and explicit stakeholder needs.

The symposium addresses to researchers in the fields of real-time seismology and earthquake engineering that focus on new methodological developments and examples of application for EEW and RR. We solicit studies that include integration of novel sensor types, the fast estimation of earthquake source parameters, rapid assessment of the potential damages/impacts of earthquakes, and risk-informed decision support systems.