

## Towards a performance-based probabilistic earthquake early warning (EEW) framework

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Since the release of public alert of Japanese earthquake early warning (EEW) in 2007, development of EEW algorithms and applications has advanced rapidly around the world, especially after the 2011 Tohoku earthquake. Despite having many new algorithms to improve the ground motion prediction accuracy of EEW, recent studies indicated some unavoidable limitations of EEW to have uncertain prediction that may significantly influence the decision-making of emergency response. In this presentation, I will review some important development and challenges of EEW from the perspective of Japan and California, as well as a decision-making framework using dynamic uncertainty information proposed in 2013. I will discuss the reason dynamic uncertainty quantification of EEW is an essential research direction to realize the real power of EEW for seismic hazard mitigation, and emphasize the need of a probabilistic EEW system that can incorporate most of the important information for ground motion prediction a priori to the real-time EEW operation.

