

## Harvard University, Solid Earth Physics Seminar

Tuesday 16 February 2016, 1:00 pm  
4th Floor Faculty Lounge, Hoffman Laboratory, 20 Oxford St.

### *Earthquake Early Warning in Japan and Improvements after the Tohoku Earthquake*

**Masumi Yamada**

Disaster Prevention Research Institute, Kyoto University

#### **Abstract:**

In Japan, earthquake early warnings have been provided to the public since 2007. The system sends out alerts via cell phone, TV, radio, and other media, with a lead time of a few seconds to tens of seconds before the arrival of strong shaking. It has provided a warning about 8 seconds after the first primary wave arrived at the closest seismic station during the 2011 M9 Tohoku earthquake.

However, current system lacks the ability to appropriately handle multiple concurrent earthquakes, which led to many false alarms during the Tohoku aftershock sequence. We use a Bayesian probabilistic approach to handle multiple concurrent events for EEW. We integrate P-wave picking time and maximum displacement amplitude from both JMA and Hi-net seismic stations into a single algorithm. A real data example based on two months data around the time of the 2011 Tohoku earthquake is studied to verify the proposed algorithm. Our algorithm results in over 90% reduction in the number of incorrect warnings compared to the existing EEW system operating in Japan.



TV screen with a warning message (NHK)