def Probabilistic Early Warning System

5. The Italian Strong Motion Network (RAN)

The Italian Strong Motion Network (RAN) is a national, wide-area monitoring system run by the Italian national emergency management department (Dipartimenti Nazionali Protezione Civile, DPC). Its aim is to optimize the effectiveness of emergency response services; to improve the evaluation, prevention and mitigation of seismic risk; to collect high quality data and to increase the number of monitoring stations by also acquiring data from other strong motion networks. A wide site survey was carried out from eastern Sicily along the Italian peninsula, covering high seismic risk areas. The recording station density and the choice of high quality geolocated strong motion instruments assure the reliability of the RAN network in the long-term. Since 2011 the network includes around 600 digital stations with GPS/900 communication and maximum inter-station distance of 30 km, with higher densities covering the areas with greater hazard.

6. Performance and Conclusions

To assess the feasibility of a nation-wide Early Warning System in Italy using the Italian Accelerometric Network, actual recordings from the RAN were played back into the PRESTo EWS: two recent earthquakes in different geographic regions, with magnitudes between 4.8 and 5.8 (Gallina di Milazzo 2007, Panarea 2008, L'Aquila 2009, Emilia 2012), and one moderate earthquake (Sicily 1669, Irpinia 1980) were simulated by playing back synthetic at present-day RAN stations. The waveforms were generated at the hodochrones. The synthetic seismograms were created using the Geosoft software iSeis and Context, 1997), which computes the complete waveform using the discrete wavelet method (Bouchon, 1981). The results are then extrapolated in time for the strong motion site, and compared with the local and real PGV at stations as a function of lead time.

The PRESTo estimates of lead time are compared with the data in Figure 3. The PRESTo estimates of lead time are compared with the data in Figure 3.