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Abstract Details

Corresponding Author : Dr. Yih-Min Wu (drymwu@ntu.edu.tw)

Organization: National Taiwan University

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Title: Progress on Earthquake Rapid Reporting and Early Warning Systems
Taiwan

Abstract:

We report here the recent progress on real-time seismic monitoring i
Taiwan. Particularly on the earthquake rapid reporting (RRS) and eart
early warning (EWS) systems developed at the Central Weather Bure
(CWB), using the telemetered signals from strong-motion instrument
free-field. For the RRS, CWB has provided intensity map, hypocenter,
magnitude within one minute of the occurrence of large (M>4) earthc
since 1995. The reliability, as documented by electronic messages to
government agencies and scientists, has a nearly perfect record, espe
for large damaging earthquakes. Using a set of empirical relationship
large data set collected during the 1999 Chi-Chi earthquake, CWB ha
able to release through RRS the estimated distributions of PGA, PGV
potential damage within a few minutes after a big earthquake. This n
real-time damage assessment is shown to be critically useful for rapi
disaster emergency response and rescue missions. The concept of a
magnitude determination base on the first 10 seconds of signals from
virtual and sub-network configured automatically be the monitoring s
we are able to reduce the earthquake rapid reporting time to about 3
seconds or less. This represents a significant step towards a more rea
earthquake early warning capability. This early warning system has b
operation at CWB since 2002. Comprehensive earthquake reports hav
issued mostly in less than 30 seconds, with an average of about 22 s
from the origin time since 2002. At 3 km/sec for a typical crustal shea
velocity, the present operation is not useful if an earthquake occurs le
66 km from a city, but the lead time will increase to more than 10 se
for cities at distances greater than 100 km from the source. In the lat
case, a lead time of several seconds will allows pre-programmed eme
response to take place prior to the arrival of the damaging strong sha

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