



## **Feasibility study of EEW application in Korea ; Testing different frequency bands for small earthquakes.**

H. C. CHI, J. H. PARK, and D. H. SHEEN

KERC, Korea Institute of Geoscience and Mineral Resources, Deajeon, South Korea. (chi@kigam.re.kr)

At present, it seems almost impossible to predict where and how much strong a earthquake will happen within very limited time such as two or three days before it occurs. However, the advantage of modern electronic techniques can support us very fast communication tools around nation-wide area so that we can receive P- waves arrival information from seismic stations through communication lines before S-waves strike our living site. This is the key of EEW(Earthquake Early Warning) concept that is under development around world especially including Japan, United State of America, and Taiwan. In this pilot study we proposed the direction for developing Korean Earthquake Early Warning System. Considering the state of the art techniques used in Japan, USA and Taiwan, ElarmS would be more adaptable to Korea since ElarmS can work from the low limit of moderate earthquakes around magnitude 3.5, which would annually happen in Korea. Using 27 events ranging in magnitude from 2.2 to 4.9 occurring in South Korea for 2007, we investigate empirical magnitude scaling relationships in South Korea due to the variation of the duration of the P waveform. We measure the maximum predominant period and the peak displacement or velocity amplitude from the first few seconds of P wave arrivals to derive period-magnitude and amplitude-magnitude scaling relationship, respectively. We find that it is possible to determine the magnitude of earthquakes only using the first 2 seconds of the P wave and, for the period-magnitude relationship, 10 Hz low-pass filter yields better estimate than 3 Hz. This is because the magnitudes of most events used in this study are too small (<3.0). It is also shown that peak displacement for velocity instruments and peak velocity for accelerometers have their own magnitude scaling relationships, respectively. Thus, for the amplitude-magnitude relationship, like the relationships in northern California, two individual amplitude scaling relationships would be necessary.