



Towards the development of an early warning system in Greece: First results using data recorded at the HL Seismic Network

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The region of Greece is the most active seismic region in Europe with a large number of earthquakes occurring each year, some of them reaching magnitude greater than 6. The Institute of Geodynamics of the National Observatory of Athens (NOA_IG) operates a digital real time broadband seismic network since 2000 that covers the entire Greek region (<http://bbnet.gein.noa.gr>), with more stations added each year and with the FDSN code Hellenic (HL). Developments from Nacamura (1998) and Allen and Kanamori (2005) showed lately that the dominant period of the P wave onset can be used in some cases to correlate with the earthquake magnitude.

An application of the Allen and Kanamori method for the early determination of earthquake magnitude was studied in the broader Greek region, using earthquake data recorded at the HL Seismic Network during the period 2000 to 2006 of local magnitude greater or equal to 3.5. These were further selected to be recorded by two or more stations, within epicentral distance less than 100 km, and empirical relationships were derived between the local magnitude and the dominant period of a fixed P-wave onset using a linear fit.

Several data subsets were defined, according to magnitude ranges and number of stations recorded within the selected epicentral distance and correlations with resulted empirical relationships were examined. The results show that a general trend between local magnitude and dominant period exists but it becomes clearer only for magnitudes greater than 4.5. The fact that the Greek region doesn't have many events with

local magnitude greater than 5.5 reduces the reliability of the method and the derived relationships for the smaller magnitude events.

Finally, a separate study was performed using a single station at the Valsamata of Cephalonia (VLS), where the most seismically active region within Greece exists. Again there is a lack of larger events but even within the short range of magnitude between 4.0 and 5.8 a clear trend exists between the local magnitude and the dominant period.