SECOND EUROPEAN CONFERENCE ON EARTHQUAKE ENGINEERING
AND SEISMOLOGY, ISTANBUL AUG. 25-29, 2014

EFFORTS TOWARDS RAPID SOURCE ESTIMATION IN GREECE

Nikolaos S. MELIS[1], Christos EVANGELIDIS[2] and Konstantinos BOUKOURAS[3]

The Aegean and adjacent areas constitute the most seismically active region in Europe. The National Observatory of Athens, Institute of Geodynamics (NOA-IG) monitors seismicity in this region over 120 years. NOA-IG aims to inform the State and the general public straight after a felt earthquake, with the maximum possible information regarding the source and earthquake shaking and to facilitate with this information as accurately as possible, the Civil Protection Agencies and the Local Authorities to prepare themselves for appropriate actions.

Further responsibilities regarding early warning information have been added to NOA-IG, through the appointment in September 2010 as the Hellenic National Tsunami Warning Centre. Again, information regarding source parameters and particular rapid source estimation are of vital importance, in order to select as soon as possible a tsunami model that can represent the expected disaster or to distinguish as early as possible whether only information is needed to be provided, accordingly.

In this particular study, we present efforts and their results, to automatic evaluate and produce not only source parameters such as earthquake magnitude, epicentre and focal depth, but also moment tensor or focal mechanism.

Through the European funded FP7 project NERA, several near real time operating modules were installed on board the NOA-IG seismic signal processing platform, which is driven mainly by SeisComP3. Examples of FMNEAR, MWNEAR, ISOLA, Early-Est are amongst some of those modules, which are compared and the resulted correlated outputs demonstrate the effectiveness of their use during moderate and strong local and regional earthquake events in the aforementioned region.

Specific adjustments and adaptations of the above studied modules for their application in the Aegean region are presented. The complexity of the seismotectonic regime in the region and the epicentres of strong events located outside the area the network covers are important issues that are also investigated.

REFERENCES

Delouis B., Charlety, J. and Vallee, M. (2009), A Method for Rapid Determination of Moment Magnitude Mw for Moderate to Large Earthquakes fron Near-Field Spectra of Strong-Motion Records (MWSYNTH), BSSA, 99 (3), 1827-1840.

Sokos, E. and Zahradnik, J. (2008), ISOLA a fortran code and a MatLab GUI to perform multiple point source inversion of seismic data, Comput. Geosci., 34 (8), 967-977.

Lomax, A. and Michelini, A. (2011), Tsunami early warning using earthquake rupture duration and P-wave dominant period: the importance of length and depth of faulting, Geophys. Journal Int., 185, 283-291, doi: 10.1111/j.1365-246X.2010.04916.x.

[1] Dr, National Observatory of Athens, Institute of Geodynamics, Athens, Greece, nmelis@noa.gr
[2] Dr, National Observatory of Athens, Institute of Geodynamics, Athens, Greece, cevan@noa.gr
[3] Mr, National Observatory of Athens, Institute of Geodynamics, Athens, Greece, kbouk@noa.gr