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TOWARD REAL TIME EARTHQUAKE DAMAGE ASSESSMENT IN THESSALONIKI: IMPLEMENTATION OF EARTHQUAKE EARLY WARNING

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In the framework of the REAKT-Strategies and tools for Real time EArthquake risK ReducTion FP7 European project, the Research Unit of Soil Dynamics and Geotechnical Earthquake Engineering of the Aristotle University of Thessaloniki (SDGEE-AUTH), in cooperation with the Seismological Laboratory of the University of Patras (UPAT), has been engaged in the implementation of an Earthquake Early Warning (EEW) system for the city of Thessaloniki. This system will comprise the basis for further developing a real-time earthquake damage assessment procedure for specific buildings/structures or/and aggregates. In this work we present the first results from the pilot implementation of two different EEW software packages: PRESTo (PRobabilistic and Evolutionary early warning SysTem, http://www.prestoews.org; e.g., Satriano et al., 2010; Zollo et al., 2010) and VS (Virtual Seismologist; e.g., Cua, 2005; Cua and Heaton, 2007).

PRESTo processes in real-time the accelerometric data streams of EUROSEISTEST stations (http:// euroseisdb.civil.auth.gr) and of the recently installed strong motion stations of SDGEE-AUTH in and around the city of Thessaloniki. So far results are based on playbacks of data that were recorded mostly by the EUROSEISTEST array during the last decade. It is shown that the existing network is capable of providing satisfactory estimates of location and magnitude of earthquakes occurring in the Mygdonian graben, i.e. the area that hosted the epicentre of the destructive for the city of Thessaloniki earthquake of 1978 (M6.4). The results are available within few seconds after the events origin (usually 5-6 secs), which leaves a warning interval of at least 5 sec for the closest to the center of the Mygdonian graben parts of Thessaloniki.

VS operation by UPAT is based on the live streams of the Hellenic Unified Seismological Network, supplemented, where possible, by accelerometric data. UPAT operates VS since May 2013 and has already processed, in real-time, an event of M4.2 that occurred in the Mygdonian graben and was widely felt in Thessaloniki. The first VS alert for this event was issued 19 sec after the origin time, which is a quite small time window compared to corresponding results for other parts of Greece (Sokos et al., 2014). However, this time interval is still large for EEW purposes and we investigate the possibility of minimizing it through the addition of strong motion data from SDGEE-AUTH stations.

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In general, this work aims to present results from the under testing EEW systems in Thessaloniki and provide a discussion on actions toward improving their performance, as well as on the more general topic of the feasibility of EEW in Thessaloniki toward the real-time damage assessment of buildings.

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