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Near Real-Time Earthquake Exposure and Damage Assessment: An Example from Turkey

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Confined by infamous strike-slip North Anatolian Fault from the north and by the Hellenic subduction trench from the south Turkey is one of the most seismically active countries in Europe. Due this increased exposure and the fragility of the building stock Turkey is among the top countries exposed to earthquake hazard in terms of mortality and economic losses.

In this study we focus recent and ongoing efforts to mitigate the earthquake risk in near real-time. We present actual results of recent earthquakes, such as the M6 event off-shore Antalya which occurred on 28 December 2013. Starting at the moment of detection, we obtain a preliminary ground motion intensity distribution based on epicenter and magnitude. Our real-time application is further enhanced by the integration of the SeisComp3 ground motion parameter estimation tool with the Earthquake Loss Estimation Routine (ELER). SeisComp3 provides the online station parameters which are then automatically incorporated into the ShakeMaps produced by ELER. The resulting ground motion distributions are used together with the building inventory to calculate expected number of buildings in various damage states. All these analysis are conducted in an automated fashion and are communicated within a few minutes of a triggering event. In our efforts to disseminate earthquake information to the general public we make extensive use of social networks such as Tweeter and collaborate with mobile phone operators.