

Application of Post-earthquake, Real Time Shake- and Loss-map Assessment in Turkey

Karin Şeşetyan, Mine Demircioğlu, Can Zülfikar, Ufuk Hancılar,
Yaver Kamer, Mustafa Erdik

Abstract

Potential impact of large earthquakes on urban societies can be reduced by timely and correct action after a disastrous earthquake. Modern technology permits measurements of strong ground shaking in near real-time for urban areas exposed to earthquake risk. Almost-real time assessment of ground shaking and losses after a major earthquake can be achieved by implementing the following steps:

- Finding of the most likely location of the source of the earthquake using regional seismo-tectonic data base, supported, if and when possible, by the estimation of fault rupture parameters from rapid inversion of data from on-line regional broadband stations,
- Estimation of the spatial distribution of ground shaking intensity,
- Estimation of the losses and uncertainties at various orders of sophistication (buildings, casualties)

In this study, ELER[©] software, which has been developed in EU FP6 NERIES Project - Network of Research Infrastructures for European Seismology, is used for applications of post-earthquake, real time shake- and loss-map assessment in Turkey. Based on the estimated ground shaking intensity distributions, ELER[©] provides a deterministic model for regional estimates of building damage and casualty distributions based on the EMS98 building vulnerability relationships and regional building inventory data bases and population distributions and estimating the total number of casualties and their geographic distribution either using regionally adjusted intensity-casualty or magnitude-casualty correlations and population distributions. Several recent damaging earthquakes in Turkey such as the 1992 Erzincan, 1995 Dinar, 1999 Kocaeli and 2003 Bingöl events are analyzed with ELER.