

RECENT APPLICATIONS FOR RAPID ESTIMATION OF EARTHQUAKE SHAKING AND LOSSES WITH ELER SOFTWARE

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Abstract:

A methodology and software package entitled Earthquake Loss Estimation Routine (ELER) was developed for rapid estimation of earthquake shaking and losses throughout the Euro-Mediterranean region. The work was carried out under the Joint Research Activity-3 (JRA3) of the EC FP6 project entitled Network of Research Infrastructures for European Seismology (NERIES). The ELER methodology anticipates: 1) finding of the most likely location of the source of the earthquake using regional seismo-tectonic data base; 2) estimation of the spatial distribution of selected ground motion parameters at engineering bedrock through region specific ground motion prediction models, bias-correcting the ground motion estimations with strong ground motion data, if available; 3) estimation of the spatial distribution of site-corrected ground motion parameters using regional geology database using appropriate amplification models; and 4) estimation of the losses and uncertainties at various orders of sophistication (buildings, casualties). The multi-level methodology developed for real time estimation of losses is capable of incorporating regional variability and sources of uncertainty stemming from ground motion predictions, fault finiteness, site modifications, inventory of physical and social elements subjected to earthquake hazard and the associated vulnerability relationships which are coded into ELER. The present paper provides brief information on the methodology of ELER and provides an example application with the recent major earthquake that hit the Van province in the east of Turkey on 23 October 2011 with moment magnitude (M_w) of 7.2. For this earthquake, Kandilli Observatory and Earthquake Research Institute (KOERI) provided almost real time estimations in terms of building damage and casualty distribution using ELER.

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