



Probabilistic approach for earthquake scenarios in the Marmara region from dynamic rupture simulations

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The Marmara region (Turkey) along the North Anatolian fault is known as a high potential of large earthquakes in the next decades. For the purpose of seismic hazard/risk evaluation, kinematic and dynamic source models have been proposed (e.g. Oglesby and Mai, GJI, 2012). In general, the simulated earthquake scenarios depend on the hypothesis and cannot be verified before the expected earthquake. We then introduce a probabilistic insight to give the initial/boundary conditions to statistically analyze the simulated scenarios. We prepare different fault geometry models, tectonic loading and hypocenter locations. We keep the same framework of the simulation procedure as the dynamic rupture process of the adjacent 1999 Izmit earthquake (Aochi and Madariaga, BSSA, 2003), as the previous models were able to reproduce the seismological/geodetic aspects of the event. Irregularities in fault geometry play a significant role to control the rupture progress, and a relatively large change in geometry may work as barriers. The variety of the simulate earthquake scenarios should be useful for estimating the variety of the expected ground motion.