Rapid Estimation of Spatial Distributions of Building Damages in the 30 October 2020 Aegean Sea Earthquake

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An Mw 6.9 (Ml 6.6) earthquake occurred at an estimated focal depth of 12 km in the Aegean Sea on October 30th, 2020. 115 people died in Turkey in the devastating earthquake, it left more than one thousand people injured and several hundreds of families in need of a shelter. The strong ground shaking further amplified by local site effects caused building collapses and substantial damages throughout the city of Izmir (Turkey) as well as in Samos Island (Greece). In the aftermath of the event, an intensity-based damage analysis was conducted for the rapid estimation of number of damaged buildings at regional scale. For this purpose, first, spatial distributions of PGA, PGV values and instrumental intensities were computed by also incorporating the recorded ground motion data made available by several institutions. Numbers of damaged buildings at each EMS-98 damage grade were then estimated using the intensity-based, regionally adjusted structural vulnerability relationships. This paper presents the geographical distributions of rapid damage estimations and compares them to the observational damage data.