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Contribution of a new seismic amplification factor map approach for shakemaps improvement: the Croatia Mw=6.4 earthquake scenario.

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Estimation of site effects over large areas is a key-issue in a seismic risk mitigation perspective.

We prove here that the IGAG20 approach (Falcone et al., 2021), developed for the estimation of the stratigraphic Amplification Factors (AF) at a national scale for Italy, can be used in international context, as it is based on AF-V_{s30} laws developed according to 40 geo-morphological clusters available globally after Iwahashi et al. (2018) and V_{s30} proxy laws after Mori et al. (2020).

The availability of AF maps is fundamental for the improvement of the estimates of surface shaking for the "shakemaps" produced after the seismic events, and for the consequent improvement of the preliminary estimates of coseismic effects (i.e. landslides and liquefaction) and damage of residential buildings.

The IGAG20 approach was implemented for evaluating the shaking maps for the recent Mw=6.4 Croatian seismic event, with a focus on the three most affected localities: Petrinjia, Sisak, and Glina. From the OpenQuake engine, Silva et al. (2014), a stochastic scenario analysis was performed and PGV and PGA shaking maps amplified with AF maps were produced. With the PGV map, landslide and liquefaction probability maps are produced respectively with the Nowicki et al. (2018) and Zhu et al. (2017) models. With the PGA map, a preliminary residential buildings damage estimation is produced and compared with the EMS98 damage distribution available from the grading maps produced by COPERNICUS (https://emergency.copernicus.eu/mapping/list-of-components/EMSR491). Finally, all the shaking maps are compared with USGS products (https://earthquake.usgs.gov/earthquakes/eventpage/us6000d3zh/executive).

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