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RINTC – A project to assess the seismic risk of code-conforming structures in Italy

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RINTC started in 2015, is a joint project, of ReLUIS and EUCENTRE two centers of competence of the Italian civil protection for seismic risk. The goal of the project is to assess in an explicit manner the collapse risk of structures designed according the code currently enforced in Italy (CS.LL.PP., 2008). To this aim five structural typologies are considered: masonry, reinforced concrete, precast reinforced concrete, steel, and seismically isolated buildings. Multiple archetype structures have been designed for each typology according to standard practice in five sites across Italy spanning a wide range of hazard levels in the country. The designed structures have been converted in 3D models the vulnerability of which has been analyzed via multi-stripe non-linear dynamic analysis. Integration of the official Italian hazard (i.e. Stucchi et al., 2011) and estimated vulnerability yielded annual failure rate of each of the structures. Design and modeling of the structures has been carried out to warrant the largest possible comparability of results across sites and across typologies. Despite the performance-based approach of the code, the results of the first year, referring to reinforced concrete and masonry structures, quantify the heterogeneity of risk among structures of the same type, yet designed to resist different hazards, and across typologies for the same site. These results only refer to collapse and only include uncertainty related to record-to-record variability, while the undergoing tasks are aimed at increasing the population of structures and the considered limit states, enhance comparability of results, and to include modeling uncertainty.

References

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