Vulnerability curves calibrated using damage data of 2013 earthquake in Lunigiana and Garfagnana (Italy)

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ABSTRACT
For the seismic risk mitigation, vulnerability analysis at territorial scale represent effective and quick tool for public administrations.
The objective of this work is to validate the vulnerability curves of the building stock starting from hazard of the territory and typological-structural characterization (CarTIS) of the buildings, to provide damage/unusability scenarios of sub-communal homogeneous areas.
To this purpose, information contained in more than 3000 AeDES survey forms are used, filled out for buildings of the Lunigiana and Garfagnana areas (north-west of the Tuscany Region) hit after the earthquake of 21/06/2013 (M_L = 5.2 and M_W = 5.3) and a CarTIS database specially developed in a GIS environment.
The study concludes with the proposal to modify parametric vulnerability curves for low values of macroseismic intensity EMS98 (IV-VI) or PGA (0.04g-0.30g) and with the definition of new empirical correlations between percentage of unusable buildings and EMS98 degrees of damage and/or shaking parameters.