



Probabilistic Seismic Hazard Assessment For Argentina

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Abstract

The new seismic hazard map of Argentina is obtained through a Probabilistic Seismic Hazard Assessment using a complete catalog integrated by 6 databases: INPRES (Argentina National Network, S. I. S. R. A. catalog of CERESIS, The International Seismological Centre, GUC from National Seismological Centre from Chile, PDE from United States Seismological Service and Global CMT from Harvard University. The complete catalog was made homogeneous and non-independent seismic events were omitted using empirical equations for aftershock detection. The Seismic regionalization considered homogeneously distributed earthquakes and quaternary deformation structures compiled and published by the Argentine Mining Geological Service (SEGEMAR). Each of the 131 classified regions was computed considering it as a seismicity homogeneous volume depending on the seismic depths distribution mobile average. Gutenberg-Richter b-value and its standard deviation were obtained by a log-normal distribution of b-values calculated using Maximum Likelihood estimations varying the minimum magnitude and magnitude interval. Alternative algorithms such as Kijko and Smith (2012), and Ordaz and Guirado (2017) were used to confirm calculations and in the Logic Tree. Rupture dimensions were calculated using Wells and Coppersmith (1994) equations. Strong motion Attenuation were selected from the analysis of local data compared to several published model including NGA and GMPE attenuation models. PSHA results for Argentina were calculated for return periods of 145, 475, 975, 2475, 4975 and 9975 years and spectral periods of 0.01, 0.02, 0.03, 0.04, 0.05, 0.1, 0.2, 0.3, 0.4, 0.5, 1, 2, 3, 4, 5, 10 seconds. Disaggregation chart analysis helped to identified main seismic hazard sources for places of especial interest as hydroelectric dams. Then, a Deterministic Seismic Hazard Analysis was realized to evaluate worst case scenario.

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