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Improvement of the intensity prediction equation by mean of geologic and topographic corrections. Austrian ShakeMap.

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To continue with the improvement of the intensity prediction model for Austria, the inclusion of Vs30 measurements and a new approach for correcting the topographic effect, especially near to the source, was included.
As it known, Austria is characterized by a moderate seismicity and rather low hazardous areas. However, earthquakes can occasion great damage and losses, especially in densely populated and industrialized areas. Therefore, the goal of this study is to obtain an intensity prediction equation for risk and hazard assessment with the final aim of updating the Austrian seismic hazard map.
The data set encloses more than 250 earthquakes between 1000 and 2014. The selected earthquakes were to meet the following characteristics; the moment magnitude was constrained to be greater than or equal to 3; only idp's with local intensities equal to or greater than III were kept; and exclusively events with at least 10 reported intensity values were used. Furthermore, events outside the period 1992 to 2014 were removed for the computation of the empirical model since instrumental data was available for this period of time.
To develop the model, firstly, the final macroseismic data set was corrected by means of a Vs30 map, which was obtained from a geological classes classification [Stefan Weginger et al, 2018]. A Vs30 value was assigned to each of the geological classes, and an intensity correction factor obtained for the subsequent correction of the macroseismic data. Secondly, the empirical model was obtained by a Least Square Adjustment (LS-Adjustment). Finally, a new approach for the topographic correction was applied.

[1] Stefan Weginger et al, Progress in GMPE and ShakeMap development in Austira with event-based propagation laws, (2018, EGU, SM8.01 – Real time seismology and earthquake early warning).