

ARMONIA - Homogenization of cross-border accelerometric networks between Northeastern Italy and Austria: Selection of new sites and instruments for Earthquake Monitoring in Austria

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The seismically active Southeastern Alps region has a moderate seismic hazard with an expected maximum acceleration for an exceedance probability of 10% in 50 years of 0.250 g. In the border region between Austria and Italy several seismological networks are operated. The main ones are the Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS) seismological network, the Friuli Venezia Giulia Accelerometric network (University of Trieste), which is integrated to the National Accelerometric Network (Dipartimento della Protezione Civile Nazionale) and the Austrian seismological Network (ZAMG, Vienna). These three networks are all part of the Central Eastern European Earthquake and Research Network (CE3RN). The interregional ARMONIA project between Austria and Italy aims to an improved cooperation between the civil protection institutions for disaster reduction in case of strong earthquakes in the cross border region. In such a case sharing of real-time seismic data is essential for determining areas with the highest intensities and the probable impacts.

The national seismic network of Austria consists of 19 broad-band stations (isolated places) and 20 strong-motion stations (populated areas). The actual network geometry is unevenly distributed and therefore the accuracy of earthquake locations (especially the focal depth) can vary considerably along Austria. The densest network distribution is found in the central part of Tyrol. The estimated network threshold for automatic identification of local earthquakes varies between magnitude $0.8 < M_l < 1.8$. For the site selection of new stations we generated and combined maps for the location accuracy (GT5-criteria), population data, maximum documented intensity of settlements, epicenter location of documented earthquakes that have caused damage, the network magnitude threshold and the national seismic hazard map.

Guidelines for instrument selection are part of the technical criteria and include – in no particular order – resolution, bandwidth, integration into the data acquisition system, station maintenance and last but not least the price. A selection of instruments will be installed for duration of several weeks in the seismically very active region Umbria in Italy. This should allow recording at least a few earthquakes under natural conditions. The test will be continued under laboratory conditions on the Conrad-Observatory, a high-quality research facility near Vienna. In the second phase of the test and based also on the experiences of the initial installation, a manual for instrument installation will be compiled.