



Near Real-Time ShakeMaps in Italy

A. Michelini (1), L. Malagnini (1), B. C. Worden (2), D. J. Wald (2) and the S4 Team
(1) Istituto Nazionale di Geofisica e Vulcanologia, Italy, (2) USGS, USA

Since 2006, the National Institute of Geophysics and Vulcanology (INGV) in Rome has started to calculate shakemaps using the USGS-ShakeMap package. The data are provided mainly by the high quality regional broadband network recently installed in Italy and by strong motion and other network data when available. The goal is to estimate, within few minutes from earthquake occurrence, maps of the ground motion at the regional/local scale. This information can be of high value for civil defense purposes. The ground motion parameters (i.e., PGA, PGV and 0.3, 1 and 3.0 s SA) are obtained from the Earthworm GMEW module and, for redundancy, from the in-house developed INGV acquisition system. To account for the different wave attenuation properties through our target area, we have adopted attenuation relations previously determined for the Italian territory and neighboring areas. In practice, we have subdivided Italy into six different sub-regions each having its own attenuation law. To account for site amplifications, we are adopting site corrections based on VS30 for rock, hard and soft soils calibrated for Italy. We are also calibrating the VS30 at specific sites to better understand the site amplification phenomena. For larger events (i.e., $M > 5.5$) and in order to define the generating fault plane, we use the focal mechanism inferred from moment tensor inversion of broadband data. In our implementation of the procedure, maps of the ground motion are produced automatically in less than 5 minutes. They are then revised by a seismologist and published on the web. We show examples of shakemaps generated for earthquakes $M > 3.0$.