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ShakeMapő Implementation in Italy

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To the purpose of mitigating the effect of earthquakes on human society and organizing the emergency and rescue activities, the Istituto Nazionale di Geofisica e Vulcanologia, with the support of the Dipartimento per la Protezione Civile (DPC; Italian Civil Protection, an office dependent directly from the prime minister), has implemented the software package USGS-ShakeMapő. Two independent procedures are used to determine peak ground motion parameters (PGM) maps at INGV. The first adopts an in-house procedure that relies on the manually revised locations provided by the INGV seismic center and that are available within 30 minutes from earthquake occurrence. The second procedure is fully automatic and it relies on the Earthworm automatic location processing package. In this latter scheme the maps are determined immediately (max 4-5 minutes from event occurrence). Three main ingredients are fundamental to the generation of shakemaps - data, ground motion predictive relationships and the amplification caused by the site effects. The data used at INGV are broadband and strong motion recorded mainly by the Italian National Seismic Network, IV, and by other local networks. These data are obtained through satellite, internet and dedicated digital phone lines. For the ground motion predictive relationships, it has been implemented a six-areas regionalized model (three separate sets of equations) for small M$<$5.5 events, and, for larger earthquakes, the strong-motion-based equations by Ambraseys et al. (1996) and Bommer et al. (2000) are used. The site effects are accounted by classifying Vs30 into 5 classes, according to EuroCode8 based on the 1:100,000 geology map of Italy. For larger earthquakes where the fault finiteness is important for the synthesis of the ground motion, we invert for simplified extended fault models to obtain active fault plane on which rupture has occurred. In this work, we assess on one side the robustness of the calculated maps as function data, predictive equations, site effects and source finiteness.