Geophysical Research Abstracts, Vol. 9, 09654, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-09654

Near real-time regional moment tensor estimation using Italian broadband stations

L. Scognamiglio (1), E. Tinti (1), V. Lauciani (1), M. Quintiliani (1), A. Michelini (1), L. Malagnini (1), and D. Dreger (2)

(1) Istituto Nazionale di Geofisica e Vulcanologia, Via di Vigna Murata 605, 00143 Rome, Italy. (2) Seimological Laboratory, 207 McCone Hall, UC Berkeley, California 94720, USA.

Since 2002, the National Institute of Geophysics and Vulcanology (INGV) in Rome has started the installation of a high quality regional broadband network throughout the Italian territory. This network consists of more than 120 new stations equipped with 40 s (or longer) natural period instruments. The dense station coverage allows for the implementation of real-time regional moment tensor (MT) estimation procedures such as that proposed by Dreger and Romanowicz (1994). The automatic MT algorithm uses real-time broadband waveforms continuously telemetered to INGV, and it is triggered for events with magnitude larger than Ml 3.5. This is the lowermost value for which we have found it possible to obtain reliable MT determination in the frequency band used in the inversion (0.02 - 0.1 Hz). Presence of background noise prevents calculation of MTs for smaller size earthquakes in the same frequency range. Also, the automatic procedure verifies whether the signal-to-noise ratio is large enough for the data to be used. The solution is available within about 2-3 minutes after the earthquake location, and it is published on the web (http://earthquake.rm.ingv.it) depending on its quality. However, a solution, is always published after revision by a seismologist. A web interface has been developed to simplify the revision by the seismologist on duty. In addition, we complement these data with those from the MedNet very-broadband to improve the coverage for larger earthquakes occurring in the Mediterranean area. The results are compared to those obtained from application of other moment tensor methods. We have found a good agreement between the newly determined solutions and those from other methods. Overall, fast and accurate moment tensor solutions are an important ingredient when attempting to estimate the recorded ground shaking, and the orientation of possible fault planes, which is important to generate reliable

shakemaps.