THE 2002 MOLISE SEISMIC SEQUENCE: PRELIMINARY OUTCOMES

A temporary dense seismic network has been installed in the area shocked by the 2002 Molise earthquakes by the DipTeRis (Dipartimento per lo Studio del Territorio e delle sue Risorse, Università di Genova), by the INGV (Istituto Nazionale di Geofisica e Vulcanologia, Roma) and by INOGS (Istituto Nazionale di Oceanografia e Geofisica Sperimentale, Trieste) (Fig. 1). In this work, the DipTeRis working group presents some preliminary results obtained analyzing a portion of the collected data set (about 600 earthquakes recorded from 3rd November to 15th December 2002). In particular a tomographic inversion has been carried out in order to define a preliminary 1-D velocity model and to carefully locate the considered events. The velocity model indicates a complex structure characterized by high velocity between 10 and 15 km depth followed by a velocity inversion around 15-20 km depth. A preliminary local magnitude scale was also calibrated inverting about 8000 zero-to-peak amplitudes using a parametric scheme. Moreover, with the aim to better understand the relationships between the seismic activity and the related seismogenic sources an high-precise relative location procedure by using the double difference algorithm (Waldhuser and Ellsworth, 2000) has been applied. Routine locations obtained by applying hypo ellipse code (Lahr, 1979) is not able to well define and constrain the geometry of the active zone as showing a seismicity distribution scattered from 0 to 30 km depth (Fig. 1). In order to better investigate the spatial distribution of seismicity of the studied area, we used a waveform similarity approach joined to usage of relative location procedure. The relative location has been performed by using a double-difference earthquake location method, considering absolute travel-time measurements only, and adopting the model coming out by the tomographic inversion. The relocated seismicity confirms an about East-West trend of the earthquakes distribution and a concentration of the hypocenters between 10-20 km depth (Fig. 2). About 100 focal mechanisms related to the aftershocks have been computed from P-waves polarities and S/P amplitude ratios. The detected fault plane solutions show different source mechanisms with a greater number of strike-slip and thrust solutions with one nodal plane trending East-West in good agreement with the cmt-ingv focal mechanisms of the two main shocks (Web page INGV, Rome).
Fig. 1 - Temporary network installed in the Molise region in the period Novembre 2002-January 2003. The recorded seismicity, located by hypo-ellipse code, is also reported (black crosses).

Fig. 2 - Hypocenters locations obtained by double difference algorithm (black crosses) with respect to the hypo-ellipse routine locations (gray crosses).
REFERENCES

