



An improved real-time seismic network in the Central Mediterranean

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The Central Mediterranean is a region of active tectonics characterised by the interaction of a number of varied and sometimes poorly understood processes. Superimposed on the convergent scenario of the African plate pushing northwestward, a NE–SW directed extensional regime is active in the Sicily Channel, expressed in the form of a seismically active east-west trending system of strike-slip lineaments and a series of pull-apart grabens. The offshore seismicity of the Sicily channel, generally limited to magnitudes below 4.5, is normally difficult to quantify precisely, due to poor station coverage, yet it is believed that its analysis will considerably improve our understanding of the processes affecting the region.

We present recent improvements to real and virtual seismic networking in the Central Mediterranean, based at the Seismic Monitoring and Research Unit (SMRU), University of Malta. Within the project SIMIT (B1-2.19/11) funded by the Italia-Malta Operational Programme 2007–2013, earthquake monitoring on the Maltese Islands is being upgraded through the installation of a further two broadband stations, one of which will be on the smaller island of Gozo. A new network, ML (Malta Seismic Network), has been internationally registered with the FDSN. At the same time, the installation and implementation of SeisComP3 has enabled the setting up of a virtual, real-time Central Mediterranean network, made up of 18 stations in Southern Italy (including Sicily, Lampedusa and Pantelleria) belonging to the Istituto Nazionale di Geofisica e Vulcanologia, 3 stations in Tunisia (National Institute of Meteorology of Tunisia) and the 3 stations on the Maltese Islands. This will allow us to rapidly perform more accurate hypocentral locations in the region. The virtual network, which also incorporates a number of more distant stations, has been tuned to issue SMS alerts for potentially felt events in the Sicily Channel detected by the network, and for strong earthquakes elsewhere. Within the SIMIT project, the alert system will include Civil Protection departments in Malta and Sicily.

Small magnitude earthquakes, especially those located to the south and south-east of the Maltese Islands, may still go undetected by the network. In this case, use is made of a single-station polarization analysis method (LESSLA) developed at SMRU. The integration of data from the above methods allows us to produce a more comprehensive seismicity map for the Sicily Channel, which will be interpreted in terms of the dynamics of the Sicily Channel Rift System.

References:

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