Geophysical Research Abstracts,
Vol. 11, EGU2009-6154-1, 2009
EGU General Assembly 2009

Hellenic Seismological Network of Crete (HSNC): a new permanent seismological network in the Southern Aegean

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The Aegean region which comprises the Hellenic arc and the adjacent areas of the Greek mainland, the Aegean Sea and western Turkey, is one of the most seismically active zones of the world and the most active in western Eurasia due to the convergence between the African and Eurasian lithospheric plates. The seismic activity especially in the southern Aegean area is very intense and extends up to a depth of about 180 km. The seismicity of South Aegean is extremely high and is characterised by the frequent occurrence of large shallow and intermediate depth earthquakes. Crete marks the forearc high of the modern Hellenic subduction zone in the eastern Mediterranean.

In order to in order to provide modern instrumental coverage of seismicity in the South Aegean, as well as some more insight into the stress and deformation fields, tectonics, structure and dynamics of the Hellenic Arc from which will be possible to retrieve information about the rupture process, a seismological network of high dynamic range is installed. It is called HSNC (Hellenic Seismological Network of Crete) and consists of 11 permanent seismological stations equipped with short period and broadband seismographs coupled with 3rd generation 24bit data loggers as well as from 4 accelerographs. HSNC is rapidly expanded and expected to have complete 18 permanent seismological stations and 12 accelerographs by the end of April 2009. Data transmission and telemetry is based on conventional TCP/IP communication using a hybrid network consisting of dedicated wired ADSL links as well as VSAT links by using the private satellite hub located at lab of Geophysics & Seismology (LGS) at Chania, Crete. Data centre is equipped with a high performance computing cluster capable of providing real time estimations as well as to support great number experimental investigations using the on line or offline data streams. Prototype software solutions are developed for monitoring and controlling network elements, to automate ordinary procedures, to remote control and reroute data reception as well as to diffuse results in different forms. Today, HSNC is capable to provide estimations in real time by using rapid (<6secs), fast (180secs) and manual procedures.

Apart from this, HSNC includes a mobile network called RaDeSeis (Rapid Deployment Seismological network) which is used for real time aftershock studies. RaDeSeis consists of a central station which acts also as the central communication hub since it is equipped with VSAT. Border mobile stations are spread around the area of interest and communicate with central station using WiFi links. By developing dedicate hardware and software solutions in LGS, RaDeSeis has an installation time around 1 hour for each station which means that aftershock studies can be initiated after a few hours.