Geophysical Research Abstracts
Vol. 13, EGU2011-8626, 2011
EGU General Assembly 2011

The RING GPS network: a research geodetic infrastructure to study plate boundary deformation in the Central Mediterranean

Nicola D'Agostino and the RING Working Group Team
Italy (nicola.dagostino@ingv.it)

We present the INGV (Italian National Institute of Geophysics and Volcanology) geodetic research infrastructure and related facilities, dedicated to the observation and monitoring of current deformation of the plate boundary between Africa and Eurasia. The recent increase of continuous GPS (CGPS) stations in the Central Mediterranean plate boundary zone offers the opportunity to study in detail the present-day kinematics of this actively deforming region. For answering all the open questions related to this complex area, INGV deployed a permanent, integrated and real-time monitoring CGPS network (RING) all over Italy. The RING network (http:/ring.gm.ingv.it) is now constituted by more than 150 stations. All stations have high quality GPS monuments and most of them are co-located with broadband or very broadband seismometers and strong motion sensors. The RING CGPS sites acquire at 1Hz and 30s sampling rates (some of them acquire at 10 Hz) and are connected in real-time to the INGV acquisition centers located in Roma and Grottaminarda. Real-time GPS data are transmitted using different systems, such as satellite systems, Internet, GPRS/UMTS and wireless networks. The differentiation of data transmission type and the integration with seismic instruments makes this network one of the most innovative CGPS networks in Europe. Furthermore, the INGV data acquisition centers acquire, archive and analyze most of the Italian CGPS stations managed by regional or national data providers (such as local Authorities and nation-wide industries), integrating more than 350 stations of the CGPS scientific and commercial networks existing in the Italian region. To manage data acquisition, storage, distribution and access we developed dedicated facilities including new softwares for data acquisition and a web-based collaborative environment for management of data and metadata. The GPS analysis is carried out with the three main geodetic-quality softwares used in the GPS scientific community: Bernese GAMIT an GIPSY-OASIS. The resulting daily solutions are aligned to the ITRF2005 reference frame. Stable plate reference frames are realized by minimizing the horizontal velocities at sites on the Eurasia and Nubia plates, respectively. The different software-related solutions consistency RMS is within 0.3 mm/yr (Avallone et al., 2010). The solutions are then evaluated with regard to the numerous scientific motivations behind this presentation, ranging from the definition of strain distribution and microplate kinematics within the plate boundary, to the evaluation of tectonic strain accumulation on active faults. The RING network is strongly contributing to the definition of GPS velocity field in the Italian region, and now is able to furnish a newly and up to date view of this actively deforming part of the Nubia-Eurasia plate boundary. INGV is now aiming to make the RING (and integrated CGPS networks) data and related products publicly available for the scientific community. We believe that our network represents an important reality in the framework of the EPOS infrastructure and we strongly support the idea of an European research approach to data sharing among the scientific community. We will present (a) the current CGPS site distribution, (b) the technological description of the data acquisition, storage and distribution at INGV centers, (c) the results of CGPS data analysis, and (d) the planned data access for the scientific community.

RING Working Group:
D'Agostino N., D'Anastasio E., Abruzzese L.,Anzidei M.,Avallone A.,Cardinale V.,Castagnozzi A., Cavaliere A.,Cecere G., Cheloni D., Criscuoli F., D'Ambrosio C., De Luca G., Del Mese S., Devoti R., Esposito A., Falco L., Galvani A., Latrippa A., Massucci A., Memmolo A., Migliari F., Minichiello F., Moschillo R., Pietrantonio G., Pisani A.R., Riguzzi F., Selvaggi G., Sepe V., Serpelloni E., Zarilli L.