Topo-Iberia GPS network: installation complete

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As part of the project, titled "Geociencias en Iberia: Estudios integrados de topografía y evolución 4D: Topo-Iberia", we have established a network of 26 continuous GPS stations, covering the Spanish part of the Iberian Peninsula (22 stations) and Morocco (4 stations). A major objective behind the establishment of this array is to monitor millimeter level deformation of the crust due to the collision of African and Eurasian (including Iberian) tectonic plates. More specific goals of the project include the identification of the areas and/or specific seismic faults which exhibit higher deformation rates, which could imply an increased seismic hazard in these specific areas.

The network has been designed as two X-shaped transects crossing the peninsula from NE to SW and NW to SE, with relatively coarse distribution of the stations, superimposed with denser coverage in the seismically active areas of the Betics, Pyrenees and Cantabrian chains. The majority of the built monuments consist of 1.5-1.8 m tall concrete pillars of 40 cm in diameter anchored to the bedrock using iron rebars. One station in Huesca was built according the UNAVCO's short drilled braced monument (SDBM) specifications. All the monuments were equipped with the SCIGN leveling mounts to ensure the precise antenna alignment and re-alignment in case of the antenna replacement, as well as, tamper resistance of the monument mark. In places were the snow accumulation was possible the antennas were covered with plastic radomes. The instrumentation used is Trimble NetRS dual-frequency receivers with choke-ring antennas. The communication is mainly via cellular telephone system.

As of December 2008, the network installation has been competed and all the stations are fully operational. Here we report the milestones of the installation of the network and, as well as, present the first preliminary results of the analysis of the data. Besides the newly established Topo-Iberia CGPS stations, we have included in our daily analysis the data from the selected IGS and EUREF stations located within the region of our interest. In our analysis we also include data from the regional GPS network in Spain: CATNET in Catalonia, ERVA in Valencia, RAP in Andalucía and several other stations from Rioja, Basque country and Castilla León. The GPS data were analyzed using GAMIT/GLOBK software from MIT employing a network mode, where all the stations (including IGS continuous GPS sites) are analyzed simultaneously, followed by carrier phase ambiguity resolution.