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TopoIberia Continuous GPS Network: Design and Implementation

J. Garate(1), J. Martin Davila(1), G. Khazaradze(2), A.J.Gil(3), I.Jimenez-Munt(4), P.Ayarza(5), C. Ayala(6), J.Gallastegui(7), J.Tellez(8), G.Rodriguez-Caderot(8).

(1)San Fernando Naval Observatory. San Fernando, Cádiz(jgarate@roa.es), (2)Universidad de Barcelona, (3) Universidad de Jaén, (4) Instituto Jaume Almera, Barcelona, (5)Universidad de Salamanca, (6) Instituto Geológico y Minero de España, Madrid, (7) Universidad de Oviedo, (8) Universidad Complutense, Madrid.

The Iberian Peninsula is one of the natural laboratories proposed in the framework of the TopoEurope program for monitoring, imaging, and modeling of the interplay between processes controlling continental topography and related natural hazards. TopoIberia is the regional initiative developed to cover these objectives in that area through a multidisciplinary approach linking geology, geophysics, geodesy and geotechnology.

A GPS working group has been established in order to achieve the geodetical contribution. The first task of the group was to design the new Continuous GPS network which is going to be deployed in the region. During the initial design of the network we have kept in mind that various institutions throughout Spain have been operating CGPS stations for some time and making their data freely available to the community. However not all of these stations meet the strict requirements of high precision geodesy. For this reason the first step was to conduct a preliminary investigation to identify a set of the relatively stable stations, which could complement the new TopoIberia GPS network, without degrading its quality. Once these stations were identified, the new network was designed avoiding the duplication of CGPS in places near by. A second task performed as part of this project was the identification of the more appropriate places to locate the equipment. Different teams performed various field surveys, and decided where the monuments should be built. After a complete review

of the UNAVCO recommendations, we choose concrete pillars as monuments because their stability seems to be good enough and they could be built without further difficulties, although monuments should be adapted to the particular environment of each place.

Taking the EarthScope's Plate Boundary Observatory (PBO) component facilities as model, new autonomous systems were designed: besides GPS and antenna receiver, solar panels, batteries, power regulators and communications hardware were integrated. From the beginning of this year, we are starting the final deployment of the network: twenty two stations will be installed in different regions of Spain, while a set of four additional systems will be located in some places of Morocco, in order to complete the overview of the southern part of the Iberian region.