

EUREF launches SCIGAL: Earth Science Applications using GALILEO

EUREF (www.euref-iag.org), the Sub-commission for Europe of the International Association of Geodesy, has been developing since 1987 a set of activities related with the establishment of the European Terrestrial Reference System (ETRS89) and European Vertical Reference System (EVRS). ETRS89 provides geocentric, three-dimensional positions with millimeter accuracy, in a unique homogeneous reference system for the whole of Europe, while EVRS does the same for the height. These systems are the basis for geo-referencing in Europe, and have been recommended for adoption by the European Union, Eurocontrol and EuroGeographics, the consortium of the National Mapping Agencies (NMA) in Europe (<http://eurogeographics.org/>). ETRS89, as a well maintained and stable reference system, is also ideally suited, and commonly used, as the backbone for Earth Science applications in Europe.

A key instrument in maintaining ETRS89 is the EUREF Permanent Network (EPN). This is a network of Global Navigation Satellite System (GNSS) receivers that cover the European continent, as can be seen in the figure (www.epncb.oma.be). At present, the EPN integrates about 140 stations observing continuously with high accuracy GPS/GLONASS receivers. These receivers are operating under well-defined standards and guidelines that guarantee the efficiency of the EPN and the quality of its products. In addition, the EPN constitutes the European contribution to, and densification of, the International GPS Service (IGS), that consists of a global GPS tracking network of over 300 receivers. It produces the most-precise low-latency satellite orbits and clocks, and contributes through its tracking station coordinates to the realization of the International Terrestrial Reference System (ITRS), the most precise global reference system. The EPN contributes also to the monitoring of tectonic deformations in Europe, to long-term climate monitoring and to the

development of the standards and the operational means to disseminate GNSS data over the Internet.

For the development of all these activities, EUREF and the EPN created the structure for institutes to cooperate, share resources, develop and pursue standards, and make publicly available GNSS tracking and auxiliary data, as well as products of various kinds. This structure is the basis of the Expression of Interest for an Integrated Project submitted under the Framework Program 6 entitled "SCIGAL - Earth Science Applications using GALILEO".

Taking advantage of the expertise in GNSS data communication and analysis within the EUREF group, SCIGAL aims to establish an operational European GNSS network infrastructure exploring the full potential of the GALILEO and GPS systems serving high precision users in Geodesy, Geophysics, Meteorology, Timing and Navigation, superior to the existing science-driven infrastructure for GPS. To achieve this, SCIGAL will stimulate the development of GALILEO tracking equipment and tools responding to the highest possible standards. The research on GALILEO will focus on the development of tracking networks, receivers, tools and modelling for the scientific arena, but will also benefit the high precision surveying and navigation applications (that require cm-accuracy), timing applications and applications for operational meteorology.

This proposal for an integrated project contributes to the structuring and integration of European research by bringing researchers from various disciplines, government, industry and SME's together, through setting up multi-disciplinary services targeting the scientific, as well as, the applications of general interest. SCIGAL aims to make Europe the world leader in GNSS research, in particular for the GALILEO system. It will improve scientific modelling

and distribute up-to-date high precision GNSS data services, products and tools. This effort will be made in recognition of emerging technological and scientific trends in support of interdisciplinary Earth science research.

EUREF is developing with the active participation of almost all European countries and it is considered as a successful European-wide project. Its applications (scientific, technical and practical) and the network of people, research institutes, laboratories and national mapping authorities involved in its work, make EUREF a well-established infrastructure for a European scientific and practical initiative such as SCIGAL.

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For more information see: http://www.epncb.oma.be/papers/SCIGAL/EOI_SCIGAL.pdf