



The Geohazards Exploitation Platform: an advanced cloud-based environment for the Earth Science community

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The idea to create advanced platforms for the Earth Observation community, where the users can find data but also state-of-art algorithms, processing tools, computing facilities, and instruments for dissemination and sharing, has been launched several years ago. The initiatives developed in this context have been supported firstly by the Framework Programmes of European Commission and the European Space Agency (ESA) and, progressively, by the Copernicus programme. In particular, ESA created and supported the Grid Processing on Demand (G-POD) environment, where the users can access to advanced processing tools implemented in a GRID environment, satellite data and computing facilities. All these components are located in the same datacentre to significantly reduce and make negligible the time to move the satellite data from the archive. From the experience of G-POD was born the idea of ESA to have an ecosystem of Thematic Exploitation Platforms (TEP) focused on the integration of Ground Segment capabilities and ICT technologies to maximize the exploitation of EO data from past and future missions. A TEP refers to a computing platform that deals with a set of user scenarios involving scientists, data providers and ICT developers, aggregated around an Earth Science thematic area. Among the others, the Geohazards Exploitation Platform (GEP) aims at providing on-demand and systematic processing services to address the need of the geohazards community for common information layers and to integrate newly developed processors for scientists and other expert users. Within GEP, the community benefits from a cloud-based environment, specifically designed for the advanced exploitation of EO data. A partner can bring its own tools and processing chains, but also has access in the same workspace to large satellite datasets and shared data processing tools.

GEP is currently in the pre-operations phase under a consortium led by Terradue Srl and six pilot projects concerning different EO applications have been selected: time-series stereo-photogrammetric processing using optical images for landslides and tectonics movement monitoring with CNRS/EOST (FR), optical based processing method for volcanic hazard monitoring with INGV (IT), systematic generation of deformation time-series with Sentinel-1 data with CNR-IREA (IT), systematic processing of Sentinel-1 interferometric imagery with DLR (DE), terrain motion velocity map generation based on PSI processing by TRE-ALTAMIRA (ES) and a campaign to test and employ GEP applications with the Corinth Rift EPOS Near Fault Observatory.

Finally, GEP is significantly contributing to the development of the satellite component of the European Plate Observing System (EPOS), a long-term plan to facilitate the integrated use of data, data products, and facilities from distributed research infrastructures for solid Earth science in Europe. In particular, GEP has been identified as gateway for the Thematic Core Service “Satellite Data” of EPOS, namely the platform through which the satellite EPOS services will be delivered.

In the current work, latest activities and achievements of GEP, including the impact in the context of the distributed Research Infrastructures such as EPOS, will be presented and discussed.