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## **ESA Grid Processing on Demand for fast access to Earth Observation data and rapid mapping of flood events**

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Earth Observation (EO) is becoming a recognized source of information for disaster management, in response to natural and man-made hazards, in Europe and in the rest of the world. EO based crisis mapping services are generally delivered via projects such as GSE RISK EOS and GSE RESPOND alongside with the International Charter Space and Major Disaster, which enable to provide timely access to crisis data from a variety of EO missions.

The all-weather capability of high resolution Synthetic Aperture Radar (SAR) data provides useful input to crisis and damage mapping. This is particularly relevant for flood monitoring and SAR is considered a useful information source for plain flood events, a frequent and important type of hazard both in Europe and the rest of the world. In this context, it is needed to look at how the access and exploitation of ERS-2 SAR and Envisat ASAR can be accelerated using Grid technologies. Such capability would then help provide rush crisis mapping products combining SAR based observations with other EO crisis data.

This paper investigates how flood monitoring services can benefit from grid technology. An application called Fast Access to Imagery for Rapid Exploitation (FAIRE) has recently been developed and integrated into a Grid-based environment, called Grid Processing on Demand (G-POD). This is a Grid-based environment created at ESRIN-ESA and currently used for both research and operational activities. FAIRE exploits the capabilities of G-POD for both facilitating SAR data access and pro-

cessing, and providing suitable resources to face computational demanding tasks like coregistration, geoterrain correction, and geographic projections. Users can access the application through a dedicated Web Portal thanks to which it is possible to browse for the required products (specifying the geographical area of interest as well as the acquisition time) and to monitor the whole process.

Based on both the obtained results and discussions with specialists, it is expected that FAIRE and G-POD can provide a significant contribution to develop an enhanced flood monitoring capability. Users can take advantage of the underlying Grid technology that results in both a transparent access to the huge distributed data archive and a significant decrease of the time required by data processing.