USE OF COSMO-SKYMED DATA FOR SEISMIC RISK MANAGEMENT IN THE FRAMEWORK OF THE ASI-SIGRIS PROJECT

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ABSTRACT

In the framework of the National Space Programme, and of the European GMES Programme, the Italian Space Agency is funding several pilot projects aimed at demonstrating the full potential of Earth Observation data in the monitoring and management of natural hazards.

SIGRIS (Earth Observation System for Seismic Risk Management) is a pilot project aiming to develop a hardware/software infrastructure for the generation of decision support products for the seismic risk management.

One of the project goals is to promote the joint use of satellite remote sensing and ground observations to constrain analytical and numerical models of the earthquake source and of its effects. In this context the satellite observations to be used will be Differential SAR Interferometry and geodetic data.

Another goal is to develop a monitoring system for early damage assessment after large earthquakes. For this purpose high resolution SAR and optical space data are used, provided that near real-time data access can be assured. In fact, it is well known that a post-earthquake time delay of ~2 days is the limit for effective rescue intervention.

The SIGRIS system development is under way; in February 2009 the demonstration phase will start, and real products will be generated and tested by the Italian Civil Protection Department in its seismic risk management activities.

SIGRIS products to be tested in Knowledge & Prevention activities include for example: crustal deformation maps from time series DInSAR and GPS, and active fault models for seismic hazard assessment. Products to support the Crisis management consist of: damage assessment maps from high resolution optical and SAR data, co-seismic displacements maps from DInSAR, seismic source models, maps of earthquake-induced environmental effects from stereo optical data.

In the framework of the SIGRIS system, the use of Cosmo-Skymed X-band SAR imagery is planned for the generation of various decision support products. In particular, thanks to the short revisiting time, Cosmo data will be especially useful during the crisis management activities, allowing the long-awaited, near real-time capabilities.

In fact, the Cosmo –Skymed constellation gives the possibility to obtain all-wheather, high resolution images of any epicentral area worldwide, within at most 12 hours from the earthquake (at full constellation).

A background acquisition mission will allow to set up an image archive of many seismogenic areas of the world, which is the necessary condition for interferometric applications.

We will present and show examples of the SIGRIS decision support products based on the integration of Cosmo-Skymed imagery and ground data.