EARTH OBSERVATION SYMPOSIUM (B1)
Future Earth Observation Systems (2)

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COSMO-SKYMED: FROM THE FIRST TOWARDS THE SECOND GENERATION

Abstract

COSMO-SkyMed di Seconda Generazione (CSG) is the second generation of the Italian Earth Observation system based on space borne imaging radars. CSG will fulfil the fundamental need of ensuring operational continuity to the currently operating first generation of COSMO-SkyMed, while improving its performance. The CSG constellation will consist of two satellites in Low Earth Orbit equipped with an X-band Synthetic Aperture Radar (SAR). The CSG programme is managed and co-financed by the Italian Space Agency (ASI) and the Italian Ministry of Defence. The satellites will be launched in 2018 and 2019. As the design phase of CSG is approaching its conclusion, the picture of the system is becoming clear showing several enhancements with respect to the present generation of SAR satellite systems. If compared with the first generation of COSMO-SkyMed, the main improvements of CSG are:

- much improved resolution of spotlight modes, with the Spotlight 2A featuring 0.35 (Azimuth) x 0.55 (Ground range) m resolution at the far range;
- a diversity of spotlight modes with different resolutions, swath widths and costs in terms of satellite resources;
- all acquisition modes are available in dual-pol and an interleaved quad-pol Stripmap mode is provided;
- ScanSAR modes improved in both resolution and radiometry;
- new acquisition modes based on the SAR agility (DIscrete Stepped Strip Multi-Swath technique), or on the platform agility (theatre modes), allowing to perform multiple acquisitions on limited areas, which would have been in conflict among each other in standard, zero-doppler modes;
- a much better mission planner, exclusively based on the priority of the requests, aimed to satisfy a greater number of users;
- improved agility of the satellites, by means of a Control Moment Gyro assembly, which allows to halve the manoeuvre times;
- improved time performance of Urgent acquisitions;
- new services devoted to institutional users (e.g. the Crisis requests, which guarantee absolute priority over a selected area in situations such as civil protection emergencies) and generic users (such as the Last Minute Planning service, which allows the user to refine his/her request at the very last uplink contact prior to the acquisition);

- improved user accessibility, with the majority of the services accessible directly via web.

The paper will describe all the features which will render CSG one of the state-of-the-art Earth observation systems of the next decade.