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Paper Title:	**COSMO-SkyMed a dual use observation system with state of the art performance, evolution towards second generation**

Abstract:

COSMO-SkyMed is an Earth Observation satellite system based on SAR sensing capabilities currently operating with the full constellation in orbit. Commissioned to Thales Alenia Space by the Italian Space Agency (ASI) and the Italian MoD with 1.2 billion euros it is one of the largest investment in the World for Earth Observation and represents the first EO space system devoted to Dual-Use (Defense and Civilian). COSMO-SkyMed Seconda Generazione (CSG) represents the follow-on mission and will assure continuity of SAR observation services, while providing a dramatic improvement of performances through a generational step ahead in space and radar technologies.
COSMO-SkyMed designates the most important Italian programme for Earth Observation from space, and the spacecraft constellation was stepwise deployed from 2007 to 2010, with launch and commissioning of four satellite embarking a Synthetic Aperture Radar (SAR) for Earth observation high resolution radar imaging. COSMO Second Generation (CSG) program started since 2010, pursuing the twofold need of ensuring operational continuity to the first generation constellation, currently operating in orbit, while achieving a generational step ahead in terms of functionality, technology and performances.
From the performance point of view, the CSG constellation aims at improving the quality of the imaging service, providing the End Users with new / enhanced capabilities in terms of higher number of equivalent images and of increased image quality with respect to the first generation, along with additional capabilities (e.g. full polarimetric SAR acquisition mode) and a better operative versatility in programming and sharing the system resources among different typologies of Users requesting images of different characteristics, including first generation ones.
In accomplishing the transition from CSK to an integrated system accounting of both CSG and CSK, operational continuity to CSK will be guaranteed, meaning that CSK services provided to Users will be granted in a seamless manner. Indeed, the key words that designate the newly conceived CSG constellation are CSK mission follow-on capable to ensure Continuity of observation Services to the user Community, ensuring the dual use for Civilian and Defense purposes while providing significant steps ahead in terms of increasing System Performances, Operative Versatility, Imaging quality, and close Interoperability with legacy (CSK) and Partner's Space observation systems.
Starting from 2017, the first CSG satellite will be launched and deployed, followed by the second CSG satellite to be launched one year later.