

EARTH OBSERVATION SYMPOSIUM (B1)
Earth Observation Data Management Systems (4)

Author: Dr. Manfredi Porfilio
Italian Space Agency (ASI), Italy, manfredi_porfilio@hotmail.com

Mrs. Claudia A. M. Fiorentino
Italian Space Agency (ASI), Italy, manfredi.porfilio@asi.it

Mr. Gianni Casonato
Italian Space Agency (ASI), Italy, gianni.casonato@asi.it

Dr. Stefano Serva
Italian Ministry of Defense, Italy, stefano.serva@am.difesa.it

Mr. Andrea Cecchini
Italian Ministry of Defense, Italy, andrea1.cecchini@gmail.com

Mrs. Flavia Carnevale
Thales Alenia Space Italia, Italy, flavia.carnevale@thalesalieniaspace.com

Dr. Giuseppe D'Amico
Italian Ministry of Defense, Italy, giuseppe.damico@aeronautica.difesa.it

COSMO-SKYMED SECONDA GENERAZIONE: SPOTLIGHT FOCUSING CHAIN IMPROVEMENTS
AND INTERFEROMETRIC AND CHANGE DETECTION CAPABILITIES ENHANCEMENT
THROUGH COMMON BAND FILTERING**Abstract**

COSMO-SkyMed Second Generation (CSG) is an Earth Observation space programme funded by the Italian Space Agency (ASI) and the Italian Ministry of Defence (ItMoD), which is composed of two satellites with a Synthetic Aperture Radar (SAR) payload. CSG will assure the service continuity with respect to the current fully-deployed four-satellite COSMO-SkyMed (CSK) system, increasing its operational performances. The CSG Spotlight focusing chain will be improved through the implementation of an Enhanced -K algorithm, in order to cope with high-squinted data acquisition and to take into account the effect of the topography. Since small errors on targets height induce strong defocusing effects due to incorrect doppler rate computation, a Precise Topography and Aperture-dependent Motion Compensation (PTA MoCo) algorithm has been studied, which is a new short fast Fourier transform-based post-processing methodology capable of efficient and precise compensation of the topography and aperture-dependent residual phase errors, allowing high-quality motion compensation even in case of strong topography changes. The aim of this paper is to describe the implementation of the Enhanced -K algorithm and its improvement with respect to the Fast -K used in the first generation Spotlight processors, analyzing the quantitative performance increment on high-squinted Spotlight simulated data and PTA quality performances.