

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

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MISSION ANALYSIS ON SENTINEL-1 SPACECRAFT AND CONSTELLATION

Abstract

This paper gives the opportunity to report the last results on Sentinel-1 mission analysis as well as to present and compare different control strategies for maintenance and reconfiguration of the Constellation (Sentinel-1A and Sentinel-1B).

On one hand, the main objective is to report relevant results in terms of delta-v and propellant budget, taking into account the Sentinel-1 spacecraft constraints using the baseline station keeping strategy. This strategy is driven by the definition of two key concepts: a Reference Mission Orbit (RMO) and an Orbital Tube around the RMO where the Sentinel-1 satellites need to be maintained all along its lifetime.

On the other hand, an autonomous orbit control can be proposed as a new strategy of station keeping for new generation satellites, using the RMO as Master, and the Real Perturbed Orbit (RPO) as Slave. The same control algorithm can be used also for the reconfiguration manoeuvres between two satellites of Sentinel-1 Constellation taking into account the operational resolutions of S/C thrusters.

Finally the frequency and duration of each orbital manoeuvre (in-plane and out-plane), delta-v and propellant budget for the current baseline Sentinel-1 strategy and for the proposed one are compared.