

SMALL SATELLITE MISSIONS SYMPOSIUM (B4)  
Small Satellite Operations (3)

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SPACECRAFT CONSTELLATION DEPLOYMENT FOR THE RAPIDEYE EARTH OBSERVATION  
SYSTEM

**Abstract**

The RapidEye constellation consists of 5 Earth Observation microsattellites, and was designed to give daily revisit over any part of the Earth, with a capability of gathering a high volume of multispectral imagery at 6.5m GSD for a range of applications.

The constellation was successfully launched on a single launcher in August 2008 into a sun-synchronous orbit. The dispersion of the semi-major axes after launch was 26.6 km, and in order to meet the mission requirement of daily revisit, it was necessary to adjust the spacecraft orbits to within 100m of the same semi-major axis, with equally-spaced ground tracks.

A new Constellation Management System was developed to facilitate the planning of the required sequence of orbital correction manoeuvres. This paper gives a detailed description of this tool. We also describe the on-board navigation, attitude control, scheduling and propulsion systems that were used to execute the manoeuvres. We review the results and lessons learned from the phasing activity which brought the constellation to its operational configuration.