

SPACE SYSTEMS SYMPOSIUM (D1)
Innovative and Visionary Space Systems Concepts (1)

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IMPLEMENTATION OF REAL-TIME HIGH-ACCURACY ATTITUDE AND POSITION
DETERMINATION SYSTEM THROUGH EARTH OBSERVATION SATELLITE PAYLOAD

Abstract

The concept of attitude and position determination through earth observation data was discussed in a previous paper presented in this session in 2015. Results showed comparable accuracy to high accuracy sensors. This concept has been further implemented as an experiment on the OPS-SAT satellite, a test bed cubesat to be launched by the European Space Agency (ESA) in 2017 to validate new capabilities for space systems.

This concept allows to validate some of the satellite capabilities and develop additional features such as angular velocity determination. The paper describe in details the work of adapting the initial concept design to an operational space system, adding high accuracy determination ability to a cubesat satellite without the need for additional hardware.

Validating the ability of using the OPS-SAT optical payload instead of an expensive sensor (such as a star-tracker) will reduce cost and weight in future satellite missions and will extend possibilities for existing missions which require higher accuracy attitude and position determination.