

IAF SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Advances in Space-based Communication Technologies, Part 1 (4)

Author: Mrs. Daria Stepanova

German Orbital Systems GmbH, Germany, daria.stepanova@skolkovotech.ru

Mr. Walter Ballheimer

German Orbital Systems GmbH, Germany, walter.ballheimer@orbitalsystems.de

Mr. Mikolaj Podgorski

Scanway sp. z o.o., Poland, m.podgorski@scanway.pl

Mr. Manuel Garcia

German Orbital Systems GmbH, Germany, manuel.garcia@orbitalsystems.de

VALIDATION OF OPTICAL COMMUNICATION TERMINAL CAPABILITIES: BUILDING SCANSAT
CUBESAT**Abstract**

Free-space optical communication technology will soon boost the sector of small satellites enabling additional capabilities in terms of high speed and secure intersatellite and satellite-to-ground communications. Its potential can be applied in different fields from Earth Observation and disaster monitoring to internet provision and IoT. Even though, there are several missions of satellites carrying optical instrumentation, there is an interest to alternative instrumentation and satellite concepts.

The ScanSat satellite is a 6U CubeSat built around a telescope. The telescope's optical path is shared between a multispectral image acquisition system and an optical transceiver. The challenging attitude requirements for the optical beam pointing as well as the satellite's attitude stabilization are met by means of Fluid Dynamic Actuators. In previous publications, the satellite concept was defined as well as the optical terminal and telescope designs were introduced. The current paper proves the advantages of the selected approach. Several test campaigns have been carried out to demonstrate the performance in terms of pointing capabilities. A research on pointing accuracy advancements is conducted. Results on comparison of utilization FDAs instead of reaction wheel assemblies are shared and conclusions on the feasibility of the approach are drawn.