

15th SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)  
Small Earth Observation Missions (4)

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## FIRST LIGHT FOR THE NIGERIASAT-2 IMAGING MISSION

**Abstract**

The manufacture of the NigeriaSat-2 spacecraft was completed in 2010, and is now due for launch in May 2011. This is a state-of-the-art small satellite Earth observation mission including several innovations not previously seen on small spacecraft, which will provide high resolution imagery of the Earth. It will be placed into a low earth sun-synchronous orbit and will be used by the Nigerian government for mapping, and to monitor a number of environmental issues within the country. The key requirements of this mission are to provide high volume mapping data, coupled with highly accurate image targeting and geolocation, and sufficient agility to enable a wide range of complex operational modes.

This paper focuses on the challenges associated with designing a spacecraft system that can meet these requirements on a satellite with a mass of less than 270kg. The paper will describe how the stereo, mosaic and other imaging modes can be employed using the agility of the spacecraft. Inertia calibration and on-board navigation techniques used to give the required targeting accuracy are discussed, and the inter-action between the attitude control system and the mechanical design is detailed. The payload isolation system used to ensure image quality and geolocation performance is also described

Finally, the paper will include an overview of the final test and launch campaign, and provide the first in-orbit results from the satellite commissioning.