

30th IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)
24th Workshop on Small Satellite Programmes at the Service of Developing Countries (1)

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ON-ORBIT RESULTS AND LESSONS LEARNED FROM SEVEN YEARS OF ALSAT-1N
OPERATIONS

Abstract

The AlSat-1N, also known as Alsat-Nano is a three-unit CubeSat developed jointly by the Algerian Space Agency (ASAL) and the United Kingdom Space Agency (UKSA) for cost-effective demonstration of novel and innovative space technologies for future applications on Nanosatellite missions. Alsat-1N hosts three payloads, the first payload is a deployable boom developed by Oxford Space System, it is the world's most extended retractable boom designed for CubeSats, the second is a compact CMOS camera demonstrator, named "C3D2" and made by Open University, it is a customizable camera for CubeSats and can deliver three fields of view. The last one is the Thin Film Solar Cell (TFSC) payload, designed by the Centre for Solar Energy Research (CSER) at Swansea University, this payload tests a new cell structure placed directly into the small cover glass on a solar panel that is just 0.1 millimeters thick. The AlSat-1N spacecraft was designed, integrated, and tested by the University of Surrey with hands-on participation by the Algerian Space Agency engineers and students, going from design to launch in 18 months. The satellite was launched in September 2016, with key mission success criteria delivered in early 2017. Since then, the operations of the spacecraft are led by ASAL engineers. By September 2023, Alsat-1N would celebrate its seven years in-orbit. This paper will present the results from the three payloads throughout the life of the spacecraft and Lessons learned, both positive and negative to help inform future projects.