

OCI and ROCSAT-1 Development, Operations, and Applications

Paul Chen, L.S.Lee, and Shin-Fa Lin
National Space Program Office
8th Floor, 9 Prosperity Road
Hsin-Chu Science Based Industrial Park
Hsin-Chu, Taiwan, ROC

Abstract

This paper describes the development, operations, and applications of ROCSAT-1 and its Ocean Color Imager (OCI) remote-sensing payload. It is the first satellite program of NSPO. The satellite was successfully launched by Lockheed Martin's Athena on January 26, 1999 from Cape Canaveral, Florida.

ROCSAT-1 is a LEO experimental satellite. Its circular orbit has an altitude of 600 kilometers and an inclination angle of 35 degrees. The satellite is designed to carry out scientific research missions, including ocean color imaging, experiments on ionospheric plasma and electrodynamics, and experiments using Ka-band (20-30 GHz) communication payloads.

The OCI payload is utilized to observe the ocean color in 7 bands (including one redundant band) of Visible and Near-Infrared (434 nm~889 nm) range with the resolution of 800m square and the swath of 702 km. It employs high performance telecentric optics, push broom scanning method using Charge Coupled Devices and large scale integrated circuit chips. The water leaving radiance is estimated from the total inputs to the OCI, including the atmospheric scattering. The post process estimates the water leaving radiance and generates different end products.

The OCI has taken images since March 1999 after completing the early orbit checkout. Analyses have been performed to evaluate the performances of the instrument in orbit and to compare them with the pre-launch test results

This paper will also describe the ROCSAT-1 mission operations. Four mission phases defined during the operations life cycle will be introduced. The spacecraft operating modes and ROCSAT Ground Segment operations will also be described. Finally, the contingency operations and its management process will be delineated.