23rd IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)
Small Earth Observation Missions (4)

Author: Dr. Shufan Wu
Shanghai Engineering Center for Microsatellite, China

Dr. Tiancheng Zhao
Beijing Normal University, China
Mr. Yuan Gao
Shanghai Engineering Center for Microsatellite, China
Prof. Xiao Cheng
Beijing Normal University, China

ANTARCTIC GLACIER AND SEA ICE OBSERVATION WITH A CHINESE CUBE SATELLITE

Abstract

The research for the global climate changes calls for high quality satellite data and imageries regarding Polar Regions. In recent years, the development of immerging Earth-Observation micro/nano satellite technology provides new data source for polar region observations. The STU-2A is a newly developed nano satellite specializing in polar region observation activities. It is a 3U CubeSat(2.9kg) with a size of 30x10x10 cm and carrying an earth observation camera. It was launched on Sept. 25th, 2015 and be deployed in a 470 x 485km, 97.3 degree inclination Sun Synchronous Orbit (SSO). During the Antarctic summer of 2015/16, it has obtained images covering different sea and coastal regions including Amundsen Sea, Ross Sea and Vincennes Bay. These images were used to analysis the change of glacier and sea ice and also played a role in the navigation task of the Xuelong ship, a Chinese polar research ship. This satellite provides 100m resolution visible-light true color images, better than the MODIS data, which can only reach a maximum resolution of 250m. As the camera was specially designed for the polar region which has an environment of low solar elevation and high surface reflectance, it eliminates the oversaturation problem of the MODIS sensors and can provide high quality images. Based on data analysis and assessment, it is confirmed that this satellite data can meet the demand of glacier and sea ice observation. This paper will discuss the cubesat design configuration, the payload camera design, and present its application in antarctic glacier and sea ice observation.