

SMALL SATELLITE MISSIONS SYMPOSIUM (B4)
Design and Technology for Small Satellites - Part 1 (6A)

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Abstract

The Multi-purpose Infrared Imaging System (MIRIS) is the primary payload being developed at Korea Astronomy and Space Science Institute (KASI) for the Science Technology Satellite-3 (STSAT-3) which will be launched in late 2010. The MIRIS Space Observation Camera (SOC) system is designed to observe the Cosmic Infrared Background towards wide survey fields (10deg x 10deg) near the ecliptic poles with I ($1.05\mu\text{m}$) and H ($1.6\mu\text{m}$) wide-band filters, and also to conduct the Galactic plane survey with the narrow-band filters for mapping the Pa emission line ($1.876\mu\text{m}$) flux by the Galactic interstellar medium. The MIRIS infrared optics is a wide field (3.67deg x 3.67deg) lens system and we adopt 1 aspherical (ASPH) surface for the best optical performance. The optical system of MIRIS SOC will be cooled down to 180K by passive cooling and satellite operation. Therefore, we design the optics to deliver best performance at 180K. As the fabrication and assembly should be proceeded at room temperature, however, we convert all the lens data of cold temperature to that of room temperature. We expect that the RMS spot sizes are much less than a pixel ($40\mu\text{m}$) and the designed MTF values are over 85% for the entire field of view. In this paper, we present the specification and outlook of the MIRIS SOC optical design and current status of AR-coating, fabrication, assembly, and overall tests procedures.