

In-flight calibration of HISAKI/EXCEED by stellar observations

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The extreme ultraviolet (EUV) telescope EXCEED (Extreme Ultraviolet Spectroscope for Exospheric Dynamics) onboard the Japan's small satellite HISAKI (SPRINT-A) will be launched in August 2013. The EXCEED instrument will observe tenuous gases and plasmas around the planets in the solar system (e.g., Mercury, Venus, Mars, Jupiter, and Saturn). One of the primary observation targets is Jupiter, whose magnetospheric plasma dynamics is dominated by planetary rotation. In the EUV range, a number of emission lines originate from plasmas distributed in Jupiter's inner magnetosphere. The EXCEED instrument is designed to have a wavelength range of 52-148 nm with a spectral resolution of 0.3-1.0 nm. The spectrograph slits have a field of view of 400 x 140 arc-seconds (maximum), and the attitude fluctuations are stabilized within 5 arc-seconds. The optics of the instrument consists of a primary mirror with a diameter of 20cm, a laminar type grating, and an EUV detector using microchannel plates (MCPs). The surfaces of the primary mirror and the grating are coated with CVD-SiC.

After the launch of the HISAKI satellite and the initial check out of the instrument for 2 months, we performed in-orbit calibrations of the EXCEED instrument by stellar observations. We observed the standard stars GD71, HZ2, and FEIGE110, and measured the absolute sensitivity and the spatial resolution of the EXCEED instrument. As a result, the absolute sensitivity was $\sim 1\text{-}2\text{ cm}^2$ and the spatial resolution was ~ 16 arc-seconds. In this presentation, we report the overview and initial results of the in-orbit calibration of EXCEED.

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