

恒星観測を用いた EXCEED の機上校正計画

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In-orbit calibration of the EXCEED instrument onboard the SPRINT-A satellite

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The extreme ultraviolet (EUV) telescope EXCEED (Extreme Ultraviolet Spectroscope for Exospheric Dynamics) onboard the Japan's small satellite 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 SPRINT-A satellite and the initial check out of the instrument for 2 months, we will perform calibrations of the EXCEED instrument. We will measure the following optical performances after launch: (1) spectral resolution, (2) spatial resolution, (3) absolute sensitivity, and (4) temporal variation of sensitivity. The spectral resolution (1) will be measured during the nominal planetary observations. The other performances (2)-(4) will be measured during the stellar observations. We have listed target stars for the in-orbit calibrations from many catalogs of past UV observations (e.g., TD1, IUE, EUVE, and HST).

In this presentation, we report the overview and plan of the in-orbit calibration of the EXCEED instrument.