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Extreme ultraviolet spectroscopy of the planetary magnetospheres from the earth-orbiting satellite

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The extreme ultraviolet (EUV) telescope (Extreme Ultraviolet Spectroscope for Exospheric Dynamics: EXCEED) onboard the Japan's small satellite (SPRINT-A) will be launched in 2013. The EXCEED instrument will obtain spectral images of 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 in the Jupiter's inner magnetosphere. The EXCEED instrument is designed to have a wavelength range of 55-145 nm with a spectral resolution of 0.4-1.0 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 a 5-stage microchannel plate assembly with a resistive anode encoder. The surfaces of the primary mirror and the grating are coated with CVD-SiC. In this presentation, we report the general mission overview, the instrumentations, and the initial results of ground calibrations.