

Space and ground-based multi-wavelength observing campaign of Jupiter's aurora and the Io Plasma Torus

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Abstract

The EXCEED EUV spectrograph (55 - 145 nm) onboard the Japanese mission Sprint-A, due for launch into low Earth orbit in August 2013, will be dedicated to the study of the tenuous plasma surrounding planets in our solar system. A target of special interest will be Jupiter and its environment, and the emission from the Io Plasma Torus (IPT) in particular. A systematic campaign of observations of Jupiter and the IPT is planned over the period Oct. 2013 – March 2014. This is a unique opportunity to explore the possible links between the IPT emission distribution, the strength and character of Jupiter's auroral emissions and the conditions of the solar wind. Hence, concurrently with the EXCEED observations, a large multi-wavelength campaign has been organised to exploit this unique opportunity of gathering important diagnostic data on the complex array of physical processes taking place in Jupiter's environment. This campaign includes (this is by no means a complete list) approved FUV imaging and spectroscopy of Jupiter's Northern aurora with HST-STIS (PI: Sarah Badman), Kitt Peak 4m visible spectroscopy of the IPT (PI: Sarah Badman), Gemini observations of Jupiter H^{3+} (4 µm) aurora (PI: Melin), submitted proposals for HST-STIS FUV observations of Jupiter's Southern aurora, Io and Ganymede's footprints (PI: Bonfond), Chandra and XMM-Newton pointings of Jupiter and the IPT (PI: Kraft), Suzaku observations of diffuse X-rays from the Jovian inner magnetosphere (PI: Ezoe); in addition, ground based observations with IRTF, Subaru and other facilities are planned.

This talk will review the motivation for this vaste coordinated observing campaign, and the science that we expect to draw from it: essentially a better understanding of how the Jupiter's system works.