Japan Geoscience Union Meeting 2015
(May 24th - 28th at Makuhari, Chiba, Japan)

PPS01-19 Room:A03 Time:May 27 10:10-10:25

Dynamics of Jupiter's auroral acceleration investigated by multi-wavelength plasma remote sensing with space telescopes

KIMURA, Tomoki[1*] ; BADMAN, Sarah[2] ; TAO, Chihiro[3] ; YOSHIOKA, Kazuo[1] ; MURAKAMI, Go[1] ; YAMAZAKI, Atsushi[1] ; TSUCHIYA, Fuminori[4] ; BONFOND, Bertrand[5] ; KRAFT, Ralph[6] ; ELSNER, Ronald[8] ; BRANDUARDI-RAYMONT, Graziella[7] ; GLADSTONE, Randy[9] ; FUJIMOTO, Masaki[1] ; HISAKI, Science team[1] ; HST, Cycle 20 go 13035 team[1] ; CXO, Cycle 15 go 15100276 team[1]

[1]RIKEN Nishina Center for Accelerator-Based Science, [2]Department of Physics, Lancaster University, UK, [3]Institut de Recherche en Astrophysique et Planetologie, France, [4]Planetary Plasma and Atmospheric Research Center, Tohoku University, Japan, [5]Laboratoire de Physique Atmospherique et Planetaire, Universite de Liege, Belgium, [6]High Energy Astrophysics Division, Harvard-Smithsonian Center for Astrophysics, US, [7]Mullard Space Science Laboratory, University College London, UK, [8]NASA Marshall Space Flight Center, Space Science Office, US, [9]Department of Space Studies, Southwest Research Institute, Boulder, Colorado, US

From January to April 2014, two observing campaigns by multi-wavelength remote sensing from X-ray to radio were performed to uncover energy transport process in Jupiter's plasma environment using space telescopes and ground-based facilities. These campaigns were triggered by the new Hisaki spacecraft launched in September 2013, which is an extremely ultraviolet (EUV) space telescope of JAXA designed for planetary observations.

In the first campaign in January, Hubble Space Telescope (HST) made imaging of far ultraviolet (FUV) aurora with a high special resolution (0.08 arcsec) through two weeks while Hisaki continuously monitored aurora and plasma torus emissions in EUV wavelength with a high temporal resolution (more than 1 min). We discovered new magnetospheric activities from the campaign data: e.g., internally-driven type auroral brightening associated with hot plasma injection, and plasma and electromagnetic filed modulations in the inner magnetosphere externally driven by the solar wind modulation.

The second campaign in April was performed by Chandra X-ray Observatory (CXO), XMM newton, and Suzaku satellite simultaneously with Hisaki. Relativistic auroral accelerations in the polar region and hot plasma in the inner magnetosphere were captured by the X-ray space telescopes simultaneously with EUV monitoring of aurora and plasma torus. Auroral intensity in EUV indicated a clear periodicity of 45 minutes whereas the periodicity was not evident in X-ray intensity although previous observations by CXO indicated clear 40-minute periodicity in the polar cap X-ray aurora.

In this presentation, we show remarkable scientific results obtained these campaigns.