Suzaku and Athena view of diffuse X-ray emission associated with Jupiter’s radiation belts

We show Suzaku observations of diffuse X-ray emission associated with Jupiter’s radiation belts around solar minimum and solar maximum, and discuss future prospects with Athena observations. Suzaku found the diffuse X-ray emission in 1–5 keV around solar minimum in 2006 thanks to its low background X-ray CCDs (Ezoe et al. 2010, ApJL). However, its emission mechanism was unclear. We thus conducted an additional Suzaku observation in 2014 around solar maximum and successfully found the diffuse X-ray emission. From its power-law spectrum and no significant change of X-ray flux in 1–5 keV, we concluded that it is most probably caused by inverse-Compton scattering of solar photons by tens MeV electrons in the Jupiter’s magnetosphere (Numazawa et al. 2017, The X-ray Universe). High-energy resolution of Athena/X-IFU can reveal a constituent of the auroral ions which are highly energized and responsible for the charge exchange emission in lower energy band (<~1 keV), as well as higher sensitivity of Athena/WFI to the diffuse X-ray emission in the harder band will allow us to get more detailed informations mainly about its spacial distribution and time variation. We strongly expect that the both Athena’s instruments probably help us to understand an acceleration mechanism of the particles in the Jupiter’s magnetosphere.