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P23 In-orbit Neutron Background of the Hard X-ray Imager onboard Hitomi

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"The Hard X-ray Imager (HXI) onboard Hitomi achieved the best background performance ever in the hard X-ray band. The main focal plane camera of the HXI consisted of four layers of Si imaging detectors and a CdTe imager. In order to
improve the sensitivity in future observations, it is indispensable to reduce non-X-ray background, which is especially important for observations of diffuse sources. In this work, we investigated background produced by atmospheric neutrons, which has a significant contribution to the entire non-X-ray background but has been poorly understood, by using data during the earth occultations and blank sky
observations. We found that the background rate had positive correlation with the cosmic-ray flux in orbit, suggesting that the background was dominated by the atmospheric neutrons. Using this correlation, we extracted the flux, the spectrum and their spatial variations of the neutron background. We also made a comparison between the extracted neutron background measurement and estimates by our Monte-Carlo simulations."

Presenter: Mr SUZUKI, Hiromasa (The University of Tokyo)

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