

P09 Detail studies of the accretion disk of the black-hole binary LMC X-3 with Suzaku

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A black-hole binary (BHB) consists of stellar-star mass black hole and companion star. The accretion disk around the black hole is formed with matter from the companion star, and shines brightly in X-ray due to the release of gravitational energy. Therefore, X-ray is suitable to study physics of accretion disk and black hole. The accretion disk shows two states depending on geometrical structure and optical thickness, which are called as high/soft and low/hard states. LMC X-3 is a BHB with a low absorption column density and possible to study the emission of the accretion disk well below 1 keV. It was observed three times by X-ray satellite "Suzaku". XIS and HXD detected the emission from 0.5-30 keV. We analyzed the three observations with referring to the previous method (Kubota et al. 2010). Among the three datasets, the luminosity changed from 2.3% to 13.5% of the Eddington luminosity. The brighter spectra show the dominant disk emission observed in the high/soft state, while the faintest one has the relatively bright power-law emission in the low/hard (or intermediate) state. With applying the multi-color disk model, we obtained that the disk inner radius moves away in the faintest dataset. In this presentation, we report the detail comparison of the three observations and discuss the deviation from the simple multi-color disk model.

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