N19a New Results from ASCA on the Type II Bursts of the Rapid Burster

○ 井上 一, Putra Mahasena (宇宙科学研究所)

Type II burst properties of the Rapid Burster (MXB 1730−335) have been studied with *ASCA*. The observation were performed in 1998 August and 1999 March. The data contains segments showing a range of mode-1 bursting pattern, in which a series of rapidly repetitive bursts is followed by the last biggest burst. Properties of individual bursts, including three average luminosities associated with each burst: $\langle L_{\rm b} \rangle$ (during the burst), $\langle L_{\rm q} \rangle$ (during the quiescence), and $\langle L_{\rm c} \rangle$ (during one cycle) are calculated. The burst properties in the 1998 observation are different from that in the 1999 observation, when plotted as a function of the fluence. From the analysis of average luminosities we find that the mode-1 bursting pattern is probably stretchable as a function of the total-luminosity average. We do phase-resolved spectral analysis on a set of spectra extracted from several composite bursts. By studying spectral ratios between the spectra, we find evidence that there are two components in the spectra. One component, whose shape is relatively constant at higher energy ($\gtrsim 6$ keV), vary greatly in luminosity, while the other one stays relatively constant (both in shape and luminosity). When fitted with a single blackbody model, the spectra give poor results with similar pattern in the residuals. Based on these results we analyze the spectral set using a two-component model consisting of a blackbody component and a multicolor (blackbody) disk model. We interpret the best-fit parameters of the blackbody component under an assumption of a disk-like geometry, and argue that the set of best-fit parameters, obtained with the adopted two-component model, are consistent with the expectations from attributing the type II bursts to disk-instability-related process. We develop a simple phenomenological model, based on the disk instability theory, to explain the range of bursting behavior observed in our data.