



Fast Timing Analysis of Cygnus X-1 using SPI on board INTEGRAL

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For the very first time, we report the high frequency analysis of Cyg X-1 up to hard X-ray using SPI on-board INTEGRAL. After analyzing the possible contribution from the background, and using INTEGRAL archive from March 2005 to May 2008, Power Density Spectra (PDS) were obtained until 130 keV. First, we show that their overall shape is very similar to that observed at lower energies, as they are well described by sets of Lorentzians. The strength of this fast variability (up to 40 Hz) does not drop at high energy since we show that it remains at ~25% rms, even in the highest energy bands. Second, the hard X-ray variability patterns of Cyg X-1 are state dependent: the softer the spectrum (or the lower the hardness ratio), the lower the total fractional variability and the higher the typical frequencies observed. The strength of total variability as a function of energy and state is then investigated. By comparison with simultaneous and published RXTE/PCA data, we showed that in the hard state, it remains quite constant in the 2-130 keV energy range. In our softer state, it is also flat until 50 keV and may increase at higher energy. The implications of this behavior on the models are then discussed.

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