

# Spectroscopic Study of the X-ray Dip at Pre-eclipse Phase of Hercules X-1

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## Abstract

The X-ray binary pulsar Her X-1 was observed with *Ginga* on 1988 August 28 during the orbital phase of 0.76 to 0.85 at the main-on phase of the 35 day cycle. During the observations the X-ray intensity varied by a factor of five or more on a time scale as short as 30 sec, due mostly to the soft X-ray absorption in the pre-eclipse phase. From the studies of pulse profiles and energy spectra, we revealed that there exists in the dip phase an unpulsed component which is  $\sim 3\%$  of the intensity at the non-absorbed high-level. We suggest that scattering of the source continuum by the optically thin hot corona is responsible for the unpulsed component. In the spectral analysis, we find that the high-state non-absorbed spectra can be fitted by a power-law without absorption, and the spectra observed in the different absorption states by two components of a power-law with the same photon index. An iron-K emission line is required in both cases of fitting. The estimated equivalent width of the iron line varies from 0.18 to 0.55 keV according to the change in the absorption column density along the line of sight. We suggest that the fluorescent iron line arises in a cool and relatively small region, like the Alfvén surface, and may be partially intercepted by the optically thick gas cloud passing across the line of sight.

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