

Eclipse Spectrum of Her X-1 Observed by ASCA in the Low Intensity State*

C. S. CHOI and K. I. SEON¹

Korea Astronomy Observatory

36-1 Whaam, Yuseong, Taejon 305-348

e-mail: cschoi@hanul.issa.re.kr

We present the results of analysis on the X-ray observations of the binary X-ray pulsar Her X-1, made with ASCA/SIS on August 13-14, 1993. An eclipse transition from ingress to egress was fully covered by the observations. The main findings are as follows: (1) a model of power-law plus black-body is required to interpret the entire eclipse spectrum, and the black-body component appears at < 0.7 keV, (2) the power-law continuum which has photon index $\alpha = 0.84^{+0.14}_{-0.19}$ is very similar to that of detected by Ginga/LAC ($\alpha = 0.80 \pm 0.04$), (3) the calculated eclipse flux of 2^{-10} keV, $\sim 1.8 \pm 10^{-11}$ ergs $\text{cm}^{-2}\text{s}^{-1}$, is consistent with the Ginga observation carried out in the high intensity state $\sim 2.0 \pm 10^{-11}$ ergs $\text{cm}^{-2}\text{s}^{-1}$, (4) there is no significant absorption feature, and an upper limit of the absorption column $N_{\text{H}} \leq 3 \pm 10^{20}$ cm^{-2} is determined at the 90% confidence limit. Based on these results, we suggest that extended matter surrounding the binary system should be existed persistently with stable conditions, and scattering of the source continuum by the matter is responsible for the eclipse emission.

* The present study is supported in part by the basic research project 95-5100-003 of Korea Astronomy Observatory

¹ also Department of Physics, Korea Advanced Institute of Science and Technology