

CONSTRAINING THE SHAPE OF THE ACCRETION DISK IN HER X-1: I. X-RAY OBSERVATIONS

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Hercules X-1 is one of the brightest, and most studied, of the persistent X-ray binary pulsars. Her X-1 shows a 35-day cycle in x-ray intensity: "Main High state – low state – Short High state – low state". This is caused by a tilted-twisted precessing accretion disk (e.g. see Scott, Leahy, Wilson, 2000, ApJ, 539, 392). The x-ray emission is primarily from the neutron star accretion column, occulted by the disk to varying degrees over the 35-day cycle. The 35-day cycle in Hercules X-1 has now been well determined by the RXTE/ASM in x-rays (e.g. Scott, Leahy, 1999, ApJ, 510, 974). A model of the accretion disk is constructed and is applied to fit the observations. The results give strong constraints on the the accretion disk geometry where it crosses the line-of-sight to the observer.