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Title:	A stochastic propagation model to the energy dependent rapid temporal behaviour of Cygnus X-1 as observed by AstroSat in the hard state
Authors:	Singh, K.P. (/jspui/browse?type=author&value=Singh%2C+K.P.)
Keywords:	Observations Cygnus X-1 Temperature
Issue Date:	2019
Publisher:	Oxford Academic
Citation:	Monthly Notices of the Royal Astronomical Society, 486(2), pp.2964-2975.
Abstract:	We report the results from analysis of six observations of Cygnus X-1 by Large Area X-ray Proportional Counter (LAXPC) and Soft X-ray Telescope (SXT) onboard AstroSat, when the source was in the hard spectral state as revealed by the broad-band spectra. The spectra obtained from all the observations can be described by a single-temperature Comptonizing region with disc and reflection components. The event mode data from LAXPC provides unprecedented energy dependent fractional root mean square (rms) and time-lag at different frequencies which we fit with empirical functions. We invoke a fluctuation propagation model for a simple geometry of a truncated disc with a hot inner region. Unlike other propagation models, the hard X-ray emission (>4 keV) is assumed to be from the hot inner disc by a single-temperature thermal Comptonization process. The fluctuations first cause a variation in the temperature of the truncated disc and then the temperature of the inner disc after a frequency dependent time delay. We find that the model can explain the energy dependent rms and time-lag at different frequencies.
Description:	Only IISERM authors are available in the record.
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