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## Short-term variabilities in X-ray/Optical/UV emission from Seyfert 1 galaxy NGC 4593

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**Mots-clés :** accréton, disque, noyau galactique actif, NGC 4593, rayons X, galaxies

### Abstract

We present results obtained from a detailed multi-band analysis of the Seyfert 1 galaxy NGC 4593. Publicly available *Swift* monitoring observations in optical, ultraviolet and X-ray bands were used in the present work. A total of 185 pointings over a duration of about a month were used to understand the variabilities in emission in optical, ultraviolet, soft and hard X-ray bands. It was found that the source emission in the hard X-ray band (1.5-10 keV range) was highly variable compared to that at longer wavelengths. The variability amplitude decreased gradually from hard X-ray to optical bands. A cross-correlation analysis between light curves in different bands inferred that the observed variation in ultraviolet and optical bands is strongly correlated with the hard X-ray emission. Observed time lag for changes in emission in longer wavelength bands with respect to the hard X-ray emission suggests X-ray reprocessing as the cause of variation. Though the observed lag spectrum follows a  $4/3$ rd power of wavelength, as predicted by the standard disk model, the estimated lags are found to be larger than the lags predicted from the standard disk model. This suggests that the actual disk in NGC 4593 is possibly larger than the standard thin disk. Though similar findings have been reported in NGC 5548 and Fairall 9, simultaneous near-infrared, ultraviolet, soft X-ray and hard X-ray band observations of a sample of AGNs with the 1.2 m telescope of Physical Research Laboratory at Mount Abu, India and first space-based multiwavelength observatory of India - AstroSat will provide significant information on the actual and model predicted sizes of the accretion disk.

**Keywords :** accretion, accretion disks, active galactic nuclei, NGC 4593, X-rays, galaxies

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