Title:	Revealing Thermal Comptonization of Accretion Disk Photons in IC 4329A with AstroSat.
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Abstract:	We present five simultaneous UV/X-ray observations of IC 4329A by AstroSat performed over a 5 month period. We utilize the excellent spatial resolution of the Ultra-Violet Imaging Telescope on board AstroSat to reliably separate the intrinsic active galactic nucleus (AGN) flux from the host galaxy emission and correct for the Galactic and internal reddening, as well as the contribution from the narrow- and broad-line regions. We detect large-amplitude UV variability, which is unusual for a large black hole mass AGN like IC 4329A, over such a small period. In fact, the fractional variability amplitude is larger in the UV band than in the X-ray band. This demonstrates that the observed UV variability is intrinsic to the disk and not due to X-ray illumination. The joint X-ray spectral analyses of five sets of Soft X-ray Telescope and Large Area X-ray Proportional Counter spectral data reveal a soft X-ray excess component, a narrow iron line (with no indication of a significant Compton hump), and a steepening power law ($\Delta\Gamma \sim 0.21$) with increasing X-ray flux. The soft excess component could arise due to thermal Comptonization of the inner disk photons in a warm corona with kTe ~ 0.26 keV. The UV emission we detect acts as the primary seed photons for the hot corona, which produces the broadband X-ray continuum. The X-ray spectral variability is well described by the cooling of this corona from kTe ~ 42 to ~32 keV with increasing UV flux, while the optical depth remains constant at $\tau \sim 2.3$.
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