

Variability in the Io torus as observed by Cassini UVIS

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We present observations of the Io torus made by the Cassini Ultraviolet Imaging Spectrograph (UVIS) during the first half (4-Oct-2000--14-Nov-2000) of the inbound leg of the Cassini Jupiter flyby. During this period, 49 rotations of the Jovian magnetosphere were observed, resulting in nearly 2000 spectra, covering a wavelength range of 561-1182Å. The UVIS field of view encompasses the entire Io torus, allowing measurement of the total EUV power emitted by the torus and comparison of spectra obtained simultaneously from different spatial regions (e.g. the dawn and dusk ansae). Analyses of the spectra show significant compositional changes in the torus plasma over the observing period. While the variation of torus parameters with System III longitude over the entire 41-day observation period is relatively minor (~5%), significant longitudinal variations in torus plasma composition and electron temperature are observed on shorter time scales. Several torus brightening events, lasting 5-30 hours, are observed in this time period. During these events, the torus brightness increases by up to 15% before returning to the pre-event level. The relatively short timescale for these events suggests that a change in the hot electron component of the plasma is responsible for the increased emission.