

Implications of short-term variations in Jupiter's inner electron belts observed with the Very Large Array's high sensitivity and angular resolution capabilities

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We examine Very Large Array (VLA) observations of Jupiter from different periods (1988, 1997, 2001, 2002, 2014) to present new evidence of fluctuations in the emission produced by the Jovian Electron Radiation Belts (JERB). Our data analysis at the wavelength of ~ 21 cm indicates that the spatial distribution of JERB was varying on 9 January 2014. The examination of simulated Heliospheric Environment (HE) conditions at the giant planet suggests the response of JERB to sudden enhancements in solar radiation rather than the influence of solar wind or extra-heliospheric environment. However, our analysis has not yet discussed the contribution of magnetospheric physical processes to the observed variations in January 2014. The present work emphasizes the importance of combining multi-frequency ground-based observations at high resolution, analyses of multisource data sets (in-situ, remote sensing), and theoretical modeling work to study the origins of JERB's short-term variability.

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