

X-ray Emission from Jupiter's Aurora - Chandra Observations in 2011: CME and/or Io Connection?

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Abstract

We report recent observations of Jupiter with the Chandra X-Ray Observatory (Figure 1). Given that it is uncertain whether the solar wind has a significant impact on Jupiter's X-ray aurora, we investigate the possible effects of solar activity on our observations. Specifically, we analyse Jupiter X-ray emission at a time when propagation models predicted the arrival of a Coronal Mass Ejection (CME) at Jupiter. We investigate spatial features and their temporal and morphological variability to determine whether in the short-term these might be impacted by the CME or changes in the orbital location of Io. In particular, we try to separate contributions from different charged particles thought to be at the origin of the emission.

We investigate local time variations to determine whether Jupiter's magnetosphere compression might impact X-ray aurora signatures and we track the location of Io throughout the observation to further analyse whether its orbital-location impacts on X-ray emission. We also compare our analysis with previously published observations to search for any long-term variation in the system.

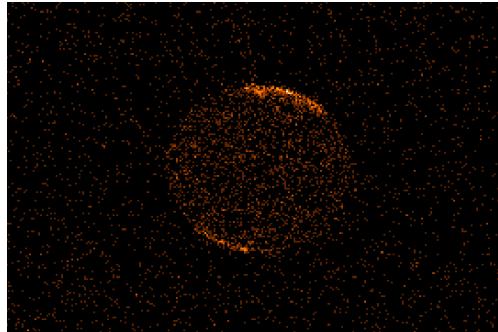


Figure 1: October 2nd 2011 image of Jupiter, with counts placed into Jupiter's reference frame. This observation was one of two ten-hour observations obtained using the Chandra X-ray Observatory at a time when propagation models predicted a Coronal Mass Ejection would arrive at Jupiter.

Figures

