

Jupiter's Aurora: Solar Wind and Rotational Influences

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Abstract. Jovian auroral emissions are observed at infrared, visible, ultraviolet, and x-ray wavelengths. As at Earth, pitch-angle scattering of energetic particles into the atmospheric loss cone and the acceleration of current-carrying electrons in field-aligned currents both play a role in exciting the auroral emissions. The x-ray aurora is believed to result principally from heavy ion precipitation, while the ultraviolet aurora is produced predominantly by precipitating energetic electrons. The magnetospheric processes responsible for the aurora are driven primarily by planetary rotation. Acceleration of Iogenic plasma by rotationally-induced electric fields results in both the formation of the energetic ions that are scattered and the formation of strong, field-aligned currents that communicate the torques from the ionosphere. In addition to rotation-driven processes, solar-wind-modulated processes in the outer magnetosphere may lead to highly, time-dependent acceleration and thus also contribute to jovian auroral activity. Observational evidence for both sources will be presented. See Waite et al. (2001, *Nat.*, 410, 787).