

B41 - Mapping the energy of Jovian auroral electrons with HST/STIS from the brightness and color ratios

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Abstract

Far-UV (FUV) spectroscopic observations of the giant planet's aurorae form a rich proxy of their magnetosphere. In this exploratory work, we first compare H₂ UV synthetic spectra to check conversion factors used in the literature to infer the total unabsorbed auroral brightness radiated in the H₂ bands. We then process FUV spectroscopic observations of Jupiter from the Space Telescope Imaging Spectrograph (STIS) aboard the Hubble Space Telescope (HST) slewing its auroral regions to construct 2D maps of both the H₂ and H-Ly α auroral brightnesses, and in turn of the Brightness Ratio (BR) and of the Color Ratio (CR). BR measures the H-Ly α /H₂ relative emission, and CR the differential emission absorption by hydrocarbons in two H₂ bands. The BR and CR observables are sensitive to electron energies below and beyond a few 10s keV, respectively. They are used to derive complementary maps of the full electron energy spectrum over the entire Jovian auroral region. Such maps are a powerful constraint to the acceleration mechanisms underlying the aurorae.