

Numerical investigation of the relationship between the Jovian auroral intensity and the electron energy

Haruna Nakazato[1]

[1] Dept. of Geophysics, Tohoku Univ.

<http://pat.geophys.tohoku.ac.jp>

In order to obtain the energy and flux of precipitating electrons from the observed auroral emission on Jupiter, we have investigated the relation between them. We simulate the degradation process of auroral electrons in the hydrogen molecular gas with a Monte Carlo technique. The emission intensity is obtained from the excitation reaction causing Lyman and Werner bands emission. As a result, the precipitating electrons with 1, 10, and 50 keV energy with constant energy flux of 1 mW m^{-2} produce 18.8, 15.6, and 8 kR, respectively. The hydrocarbons absorbing UV emission exist around 400 km height above the 1 bar pressure level. The 'color ratio' (CR) defined as the ratio 'unabsorbed intensity' referring to the 155-162 nm spectral window to the 'absorbed intensity' referring to the 123-130 nm spectral window provides the simple relation providing the precipitating electron energy from the observed spectrum. We will deduce the CR and discuss the plausible electron energy deduced from observations in this presentation.