Geophysical Research Abstracts
Vol. 20, EGU2018-10209, 2018
EGU General Assembly 2018

Jupiter's auroras in radio and ultraviolet wavelengths as seen from Juno

Masafumi Imai (1), G. Randall Gladstone (2), William S. Kurth (1), Thomas K. Greathouse (2), George B. Hospodarsky (1), Scott J. Bolton (2), John E. P. Connerney (3), and Steven M. Levin (4)

(1) University of Iowa, Iowa City, Iowa, United States (masafumi-imai@uiowa.edu), (2) Southwest Research Institute, San Antonio, Texas, United States, (3) NASA Goddard Space Flight Center, Greenbelt, Maryland, United States, (4) Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California, United States

Jupiter is the strongest auroral radio source in our solar system, producing low-frequency radio emissions in a broad frequency range from 10 kHz to 40 MHz from both north and south polar regions of the planet. These sporadic nonthermal bursts and ultraviolet (UV) auroras have been monitored with the radio and plasma wave instrument (Waves) and the ultraviolet spectrograph instrument (Juno-UVS) aboard the spinning Juno spacecraft in polar orbit about Jupiter since July 5, 2016. Waves is capable of recording the electric fields of waves from 50 Hz to 41 MHz with one electric dipole antenna and the magnetic fields of waves from 50 Hz to 20 kHz with one magnetic search coil sensor. Juno-UVS is designed to image and obtain spectra in a wavelength range from 70 to 205 nm with a 4 cm by 4 cm aperture. The Juno spacecraft rotates with a period of 30 s, which modulates the Waves spectral intensity sensed with the dipole antenna. We employ the short dipole approximation to determine (in two directions) the direction of arrival of incoming waves below 5 MHz. The three-dimensional locations and beaming properties of Jovian radio sources are determined using models for Jupiter's plasma and magnetic field. These radio sources deduced from the Waves direction-finding measurements are traced along magnetic field lines onto Jupiter's atmosphere and directly compared with the UV auroras as observed by Juno-UVS. We present some results of (quasi-)simultaneous radio-UV aurora observations, discussing similarities and differences for some elements of Jupiter's aurora.