Geophysical Research Abstracts
Vol. 19, EGU2017-9534, 2017
EGU General Assembly 2017

Observations of Jupiter's polar magnetosphere from the Jovian Auroral Distributions Experiment (JADE)

Frederic Allegrini (1,2), Phil Valek (1,2), Fran Bagenal (3), Scott Bolton (1), George Clark (4), Jack Connerney (5), Rob Ebert (1), Randy Gladstone (1,2), Thomas Kim (2,1), William Kurth (6), Steve Levin (7), Philippe Louarn (8), Chad Loeffler (1), Barry Mauk (4), David McComas (9,1), Craig Pollock (10), Drake Ranquist (3), Michelle Reno (11), Jamey Szalay (1), Michelle Thomsen (12), and the JADE and Juno MWG Team

(1) Southwest Research Institute, Department of Space Science, San Antonio, Texas, United States (fallegrini@swri.edu), (2) University of Texas at San Antonio, San Antonio, Texas, USA, (3) Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder, Colorado, USA, (4) The Johns Hopkins University Applied Physics Laboratory, Laurel, Maryland, USA , (5) NASA Goddard Space Flight Center, Greenbelt, Maryland, USA, (6) University of Iowa, Iowa City, Iowa, USA, (7) Jet Propulsion Laboratory, Pasadena, California, USA, (8) Institut de Recherche en Astrophysique et Planétologie (IRAP), Toulouse, France, (9) Princeton University, Princeton, New Jersey, USA, (10) University of Alaska Fairbanks, Geophysical Institute, Fairbanks AK, USA, (11) Austin Mission Consulting, Austin, Texas, USA, (12) Planetary Science Institute, Tucson, Arizona, USA

The Juno mission employs a suite of instruments to perform the first-ever in situ measurements of Jupiter's polar magnetosphere. Observations of the plasma environment are performed by the Jovian Auroral Distributions Experiment (JADE). JADE measures the plasma using two nearly identical electron sensors and an ion sensor. The electron sensors (JADE-E) measure electron distributions in the range of 100 eV to 100 keV. The un-deflected field-of-view (FOV) of each electron sensor is in the spin plane of the spacecraft; approximately the plane which includes the spacecraft velocity direction and the local magnetic field. Around perijove, the JADE-E sensors use electrostatic deflection to track the local magnetic field in order to measure pitch angle distributions at 1 s time resolution. The JADE ion sensor (JADE-I) measures the energy per charge and time of flight (TOF) of incident ions (mass/q < 64 amu/e) to produce composition separated ion distributions in the range of 10 eV/e to 50 keV/e. Using the spacecraft spin to sweep its FOV, JADE-I measures a full 4Pi sr ion distribution function every 30 s. The first two opportunities to observe the plasma in Jupiter's polar magnetosphere by JADE occurred on 27 August and 11 December 2016. During both of these passes, JADE crossed field lines connected to the northern and southern auroral ovals and measured polar and sub-auroral plasmas. JADE observed ions of ionospheric and Iogenic origin and a range of electron distributions, including narrow beams and distributions with emptied loss cones. We present here in situ plasma observations of the Jovian polar magnetosphere made by the JADE instrument.