Geophysical Research Abstracts
Vol. 19, EGU2017-5257, 2017
EGU General Assembly 2017

First Results of the Juno Magnetometer Investigation in Jupiter's Magnetosphere

Jack Connerney (1), Ronald Oliversen (1), Jared Espley (1), Stavros Kotsiaros (1), John Joergensen (2), Peter Joergensen (2), Jose Merano (2), Troelz Denver (2), Mathias Benn (2), Jeremy Bloxham (3), Scott Bolton (4), and Steve Levin (5)

(1) NASA Goddard Space Flight Center, Greenbelt, MD 20771 USA (jack.connerney@nasa.gov), (2) Technical University of Denmark (DTU), Lyngby, Denmark, (3) Harvard University, Cambridge, MA, USA, (4) Southwest Research Institute, San Antonio, TX, USA, (5) Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA

The Juno spacecraft entered polar orbit about Jupiter on July 4, 2016, after a Jupiter Orbit Insertion (JOI) main engine burn lasting 35 minutes. Juno's science instruments were not powered during the critical maneuver sequence (∼5 days) but were fully operational shortly afterward. The 53.5-day capture orbit provides Juno's science instruments with the opportunity to sample the Jovian environment close up (to 1.06 Jovian radii, Rj) and in polar orbit extending to the outer reaches of the Jovian magnetosphere. Jupiter's gravity and magnetic fields will be globally mapped with unprecedented accuracy as Juno conducts a study of Jupiter's interior structure and composition, as well as the first comprehensive exploration of the polar magnetosphere. The magnetic field investigation onboard Juno is equipped with two magnetometer sensor suites, located at 10 and 12 m from the spacecraft body at the end of one of the three solar panel wings. Each contains a vector fluxgate magnetometer (FGM) sensor and a pair of co-located non-magnetic star tracker camera heads which provide accurate attitude determination for the FGM sensors. The first few periapsis passes available to date revealed an extraordinary spatial variation of the magnetic field close to the planet's surface, suggesting that Juno may be sampling the field closer to the dynamo region than widely anticipated, i.e. portending a dynamo surface extending to relatively large radial distance (∼0.9Rj?). We present the first observations of Jupiter's magnetic field obtained in close proximity to the planet, and speculate on what wonders await as more longitudes are drawn across the global map (32 polar orbits separated by <12° longitude) that the Juno mission was designed to acquire.