Juno Waves Investigation Observations at Jupiter

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The Juno mission to Jupiter is providing a unique opportunity to explore the Jovian magnetosphere, especially the polar auroral regions and the equatorial area between the rings and Jupiter's atmosphere. Juno successfully entered orbit of Jupiter in July, 2016 and is currently in a ~53.5 day, high latitude polar orbit, with perigee occurring near the Jovian equator at ~1.06 R_J and apogee at ~113 R_J. Juno's science payload employs a suite of particle, field, and remote sensing instruments to provide both in-situ and remote sensing measurements. One of these instruments is the radio and plasma wave instrument (Waves). Waves measures one electric field component in the frequency range of ~50 Hz to ~41 MHz and one magnetic field component of waves in the range of ~50 Hz to ~20 kHz. The first year of observations have revealed a number of interesting radio and plasma wave phenomena. In the outer magnetosphere, trapped continuum radiation is observed, allowing an estimate of the electron density to be determined from the frequency cutoffs of the emission. Numerous magnetopause and bow shock crossings have also been encountered near perigee, providing information on solar wind and magnetospheric dynamics. At higher latitudes near Jupiter, a number of emissions related to auroral processes are detected, including auroral hiss, electron phase space holes, emissions associated with the Io flux tube, and a number of encounters or near encounters with the auroral radio emission source regions. Both electron and proton lightning whistlers have been detected, and near the equator, impulses due to impacts of micron-sized dust grains are seen. In this talk we provide an overview of these and other early results from the Juno Waves investigation.