EGU21-8101, updated on 22 Jan 2022
https://doi.org/10.5194/egusphere-egu21-8101
EGU General Assembly 2021


# Plasma waves in the inner Jovian magnetosphere at low to mid-latitudes

**William Kurth**[1], George Hospodarsky[1], Ali Sulaiman[1], Sadie Elliott[1], John D. Menietti[1], Jeremy Faden[1], Chris Piker[1], Darrelle Wilkinson[1], John E. C. Connerney[2], Scott Bolton[3], Frederic Allegrini[3], and Barry Mauk[4]

[1]The University of Iowa, Physics & Astronomy, Iowa City, Iowa, United States of America (william-kurth@uiowa.edu)
[2]NASA Goddard Space Flight Center, Greenbelt, Maryland, United States of America
[3]Southwest Research Institute, San Antonio, Texas, United States of America
[4]Applied Physics Lab., Johns Hopkins University, Laurel, Maryland, United States of America

Juno's highly eccentric polar orbit was designed to provide the first measurements at low altitudes over the poles to explore Jupiter's polar magnetosphere and auroras. Orbit precession moves the initially equatorial perijove to higher northern latitudes at a rate of about one degree per orbit. One result of the precession is that Juno crosses the equator at decreasing radial distances during the inbound portion of the orbit. Recently, Juno has crossed the magnetic equator at distances of 10 Jovian radii ($R_J$) and less. Voyager and Galileo observations have shown the magnetic equator inside of 10 $R_J$ to be the site of numerous plasma wave phenomena including whistler-mode hiss, chorus, electron cyclotron harmonics and upper hybrid bands. In addition, this is the location of the plasma sheet at the outer edge of the Io and Europa torii. The Juno orbit, with its near-polar inclination carries the spacecraft through this intriguing region to higher latitudes. This paper examines the evolution of whistler-mode chorus and hiss as well as electron cyclotron waves from the magnetic equator to higher latitudes. While there are now statistical studies of electromagnetic waves at intermediate latitudes based on Galileo and Juno observations, this paper is designed to show details of these wave phenomena utilizing the Juno Waves instrument's burst mode for high resolution. Each of these wave phenomena has the potential to interact with the electrons in the inner magnetosphere and cause pitch-angle scattering and/or acceleration, so they are important in the flow of mass and energy through the Jovian system.