Stereoscopic observations of Jupiter's decametric radio bursts with Juno, Cassini, STEREO A, WIND and Earth-based radio observatories

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Jupiter is the major auroral radio source in our solar system, producing the Jovian decametric (DAM) radio bursts in a wide frequency range of a few to 40 MHz from the auroral regions of the planet. Through a wave-particle interaction called the electron cyclotron maser instability (CMI), these non-thermal DAM radio bursts are generated very close to the local gyrofrequency. Since the Juno spacecraft detected the first DAM sporadic burst on May 5, 2016, during the approach phase to Jupiter, it has continuously observed the DAM radio arcs even after the polar orbit entry on July 5, 2016. One of the nine on-board instruments is a radio and plasma wave (Waves) instrument having three on-board receivers that monitor electric fields of waves from 50 Hz to 41 MHz with an electric dipole antenna and the magnetic fields of waves from 50 Hz to 20 kHz with a magnetic search coil sensor. Recently, *Imai et al.* [2017, *GRL*] investigated two correlated discrete arcs observed from Juno and the Nançay Decameter Array (NDA) in France at Earth. With the aid of the Jovian hollow cone beaming model and loss cone-driven CMI theory, they estimated these radio sources at about $173^\circ \pm 10^\circ$ in system III longitude mapped onto the Jovian north atmosphere and the resonant electron energy ranging from 0.5 to 11 keV. Therefore, analyzing concurrent DAM arcs yields a convenient constraint of the DAM radio source locations and latitudinal radio beaming. By expanding this study to identify the concurrent DAM arcs from widely distributed observers through our solar system, we have investigated the radio spectral data in a frequency range of 3.5 to 40.5 MHz observed from Juno at Jupiter, Cassini at Saturn, STEREO A in 1 AU orbit, WIND around Earth, and Earth-based radio observatories (Long Wavelength Array Station One (LWA1) in New Mexico, USA, and Nançay Decameter Array (NDA) in France). We show some results from the stereoscopic DAM radio observations, comparing with two types of radio beaming (strobe-light like and beacon-light like beaming).