A Juno / Hisaki joint effort to monitor Jupiter’ s electron-belt radiation during Juno’ s cruise

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At frequencies between 50 MHz and several GHz, Jupiter’ s radio spectrum is dominated by synchrotron radiation, emitted by high energy electrons magnetically confined in a region close to the planet (e.g. Jovian radiation belt). For over the past 40 years ground-based observations have demonstrated that this radio signal simultaneously varies over different time scales, from less than a day up to year periods. These variations are controlled by the spatial evolution of the relativistic electron population surrounding the planet inside Io’ s orbit. Recent analyses of Hisaki EUV data of Io plasma torus’ east-west asymmetry tend to support that large-scale dawn-dusk electric fields, driven by solar irradiation and solar wind on different time scales, can govern the dynamical behavior of Jupiter’ s electron belt. We combine different datasets of Juno (magnetometer), solar radio flux and irradiation, Hisaki (extreme ultraviolet, after Nov. 2013), and ground-based observations of Jupiter (GAVRT before 2013; VLA, GMRT after 2012) with established models of solar wind propagation and solar radiation at Jupiter to investigate the synchrotron emission variability during Juno’ s cruise (mid-Aug. 2011 to June 2016). In this paper, we discuss our preliminary results for periods when Juno is in near alignment with the Sun and Jupiter, and witnesses - while en route to Jupiter - large perturbations in the interplanetary magnetic field which would suggest that some features in the solar wind could be responsible for the occurrence of variations in the synchrotron emission a couple of weeks later.

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