TOTAL FLUX MEASUREMENTS OF JUPITER'S SYNCHROTRON RADIATION DURING THE HISAKI AND JUNO CAMPAIGN PERIODS

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Abstract

Ground-based radio monitoring of Jupiter's synchrotron radiation is a useful probe to measure short-term variations in Jupiter's electron radiation belt. Previous studies showed correlations between the short-term variation and the solar EUV flux, suggesting that enhanced radial diffusion in the heart of the radiation belt is driven by electric field fluctuations generated in Jupiter's upper atmosphere. In addition, some studies reported a possible relationship between the synchrotron radiation and the solar wind, but more observations are needed to obtain a definitive conclusion. Here, we will report a preliminary result of the total flux measurement of Jupiter's synchrotron radiation with Iitate planetary radio telescope (IPRT) in 2015 and 2016. During these periods, the Hisaki satellite observed brightnesses of both Io plasma torus and Jupiter's aurora continuously in the EUV wavelength range and monitored magnetospheric activities which were caused by both the solar wind and internal processes in the magnetosphere. In May to July 2016, the Juno spacecraft was approaching Jupiter and monitored the solar wind parameters upstream of Jupiter. The total flux measurement of the synchrotron radiation with the single dish telescope was done by the drift scan method at 325 MHz. We obtained several scans of Jupiter in one day. Some calibration sources (e.g. 3C274) were used to calibrate the total gain of the radio telescope. We will report preliminary results of the total flux measurement of Jupiter's synchrotron radiation during the Hisaki–Juno campaign periods.

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