

Low Frequency Observations of Jupiter's Synchrotron Radiation

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Jupiter's synchrotron radiation (JSR) is generated by the relativistic electrons trapped in Jupiter's inner radiation belt. Variation of JSR is, therefore, an important probe to investigate generation and dissipation processes of the relativistic electrons and deformation of their global distribution in Jupiter's inner magnetosphere. Regular and systematic JSR observations have been made by several groups including us and revealed the existence of short term variations at a time scale of several days to months inferring some electro-magnetic activities in the inner magnetosphere. Nowadays it's the time to investigate the details of variation characteristics and origin of the time variation.

A program of regular JSR observation has been made for a few months a year since 1994 around 330MHz and successive observation has been also started since 2003. So far most of regular JSR observations have been made above 1.4GHz, therefore, the regular observation around 330MHz is expected to reveal the first dynamical features of low energy electrons around 6MeV. One of the reasons why regular observations at low frequencies have not been held is due to strong galactic background interference. Though we have continued to evaluate the flux level of galactic background at the present stage, preliminary results show the following possibilities; 1) JSR flux variations around 330MHz are much larger than that at higher frequencies in both short and long time scales, 2) the short term variations have only a weak correlation with solar activities except prominently active period. In the presentation, we will report characteristics of JSR variation around 330MHz in detail, and also discuss their relations with those at higher frequencies based on campaign observations made at 325, 930 and 2230MHz in Oct.,2003 and July, 2004.

Keywords: Jupiter, Synchrotron radiation, Radiation belt, Inner magnetosphere, Relativistic electron, Time variation, 330MHz

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