

Spectrum observation of Jupiter's synchrotron radiation at the frequencies of 325, 931 and 2295MHz: plan and present status

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Jupiter's synchrotron radiation (JSR) is generated by the relativistic electrons trapped in Jupiter's 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. For more than 40 years since its discovery, JSR has been thought to be quite stable emission except for a long-term variation at a time scale of nearly the solar-cycle. However regular and systematic JSR observations have been made by several groups particularly after the event of the comet P/SL9 impacts to Jupiter, 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 (Miyoshi et al., 1999; Misawa and Morioka, 2000; Galopeau and Gerard, 2001). Nowadays it's the time to investigate the details of variation characteristics and origin of the time variation.

A program of a multi-frequency observation for JSR has been started since 2001. The JSR spectrum measurements give us information of variations of pitch angle and/or characteristics of radial diffusion of the relativistic electrons. In this program three observation frequencies measured with different facilities are adopted; i.e., 325MHz at Tohoku Univ. and Nagoya Univ., 931MHz at EISCAT, and 2295MHz at Comm. Res. Lab.(CRL). As for the 325MHz observation, although the Tohoku Univ. system will start the regular JSR observation after this summer (see Tsuchiya et al., this issue), the Nagoya Univ. system has made the JSR observations for about three months a year since 1995. The observation method has been already established at 2295MHz using the CRL system by our group (Miyoshi et al., 1999). On the other hand, we made preliminary experiments using the EISCAT 931MHz system in the autumn of 2001 at the Kiruna site, and confirmed that the system enables the JSR observation with an enough S/N. A coordinated JSR observation at the three frequencies is planned in the autumn of this year for about a month.

In the presentation, outline of the spectrum observation and present status will be shown with the objectives of this program.

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