

Multipoint observation of VLF standard signals for the study on the inner radiation belt dynamics

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We plan multipoint observation of standard time and frequency signals in VLF range in order to study temporal and spatial characteristics of relativistic electron precipitation from the inner radiation belt. The precipitation of MeV electrons into the atmosphere causes strong ionization in the ionospheric D-region. The disturbance in the D-region can be remotely sensed by measuring the intensity and phase of the VLF signals which propagate between the ground and the D-region. By multipoint observations of the VLF signal, we will obtain temporal and spatial characteristics of the radiation belt electron precipitation. For the first step of this plan, we develop a receiver system to measure the amplitude and phase of standard signals which are transmitted by NiCT from Fukushima and Saga Prefectures with frequencies of 40 and 60 kHz, respectively. In 2005, we plan to install the receivers in several points in Japan along the meridian line and start the multipoint observation.