

The observation of the moon reflected solar radio burst

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By using the Iitate Planetary Radio Telescope (IPRT) system installed in Tohoku University Iitate observatory a moon reflected Solar Radio bursts are observed for the purpose of identifying the dielectric constant of the surface material. For this observation purpose, we developed a Solar and Auroral radio Spectrometer (SAS) at the Iceland Husafell station. SAS observes the direct solar radio bursts of the direct incidence, and IPRT observes reflected solar radio burst by the moon. Based on the data obtained at these two observatories, we can reduce the reflection rate of the moon surface for many frequency bands of the electro magnetic waves.

First, to evaluate the possible observation technique to measure the reflected solar radio bursts from the moon, we estimated the power of the reflected solar radio bursts. [Hiyama et al., 2004 SGEPS fall meeting]. The result showed that it is possible to observe the reflected radio waves by using the IPRT whose observation frequency is 325MHz.

Second, we developed direct solar radio observation system (SAS) in Iceland. SAS consists of two observation systems; i.e. HF observation system and UHF system. The front-end consists of antennas, band pass filters and amplifiers. The main receiver is a spectrum analyzer (E4411B), whose observation band widths are possible to select as 10kHz (HF system) or 30kHz (UHF system). We obtained dynamic spectrum of the RF signal from 18MHz to 38MHz (HF system) and from 150MHz to 350MHz (UHF system) for each 2.0 sec. Output data are transmitted to personal computer through GPIB interface.

Initial observation of SAS have been successfully carried out from September 21, 2004. We have observed type 3.2 and 4 radio bursts. On the other hand, initial observation of moon reflected solar radio bursts by using IPRT have been carried out from December 27, 2004. In such initial observation, we have detected moon thermal radiation at 325MHz.