

## Development status of the metadata server and data archives at Tohoku University for collaborative studies using planetary radio and spectroscopic data

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Data archive of Jovian radio emissions in decametric wavelength range (DAM, 20-40 MHz) measured at ground stations of Tohoku University was started in 2004. Metadata services for IUGONET (Inter-university Upper atmosphere Global Observation NETwork, supported by the Special Educational Research Budget, and the Special Budget Project from MEXT (the Ministry of Education, Culture, Sports, Science and Technology), Japan in 2009-2014) and EuroPlanet/VESPA (Virtual European Solar and Planetary access) were also started in 2009 and 2015 in collaboration with IUGONET-member organizations, and Paris Observatory team. In 2016, we developed data archives of solar radio waves in VHF/UHF range obtained by IPRT (litate planetary radio telescope), and planetary spectroscopic data obtained by Hisaki spacecraft, and started providing their metadata for VESPA with support of JSPS France-Japan Bilateral Joint Research Program "Coordinated observational and theoretical researches for Jovian and Kronian auroral radio emissions". We are planning to add metadata of Jovian radio wave data from observatories of Kochi National College of Technology, and Fukui University of Technology, planetary spectroscopic data from Tohoku University observatories in Hawaii, and solar wind parameters from Tao's model.

Ground-based observations with multi-longitudinal stations enable us 24-hour continuous track of the activity variation of the Jovian auroral radio emissions. By using Spectrograms of Jovian decametric radiation obtained at Nancay and litate observatories, and spectroscopic data from Hisaki spacecraft, we are performing analyses of the effects of the Io's volcanic activity in 2015 on the occurrence timing of the arc structures in the spectrogram of Jovian decametric radiations. Source identification method of the Jovian decametric radiation was developed based on Nancay data [Marques et al., 2016]. We are going to apply the method to dataset including litate data, and utilize for statistical analyses. Another merit of the ground-based observations is that we can use facilities such as large antenna array, high time/frequency resolution receivers, high-speed networks, and large amount storages, which are difficult to use in the spacecraft observations. We participate Juno ground support team and exchange the information on support observation schedules.

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