

Comparison of ULF waves measured by the ERG satellite and MAGDAS network

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ULF waves in frequency band between 1.67 and 6.67 mHz, Pc 5 magnetic pulsations, are believed to contribute to the acceleration of energetic electrons in the outer radiation belt during magnetic storms. Many researchers suggested that high solar wind velocity and high long-duration Pc 5 power observed on the ground in the storm recovery phase are closely associated with the production of relativistic electrons (Baker et al., 1998; Rostoker et al., 1998; Mathie and Mann, 2000; O'Brien et al., 2001, 2003). The ground-based magnetic observations are expected to be useful tool for monitoring or interpolating globally the ULF wave in the inner magnetosphere. We try to estimate the ULF wave map in the inner magnetosphere by using the global multipoint magnetometers on the ground.

In order to achieve the goal, we examined the ULF wave during 22:00 - 23:00 UT on 21 March, 2017 measured by the Magnetic Field Experiment (MGF) on the Exploration of energization and Radiation in Geospace (ERG) satellite and compared it to the ground-based magnetometer data (MAGDAS network data are mainly used). The solar wind was the high solar wind stream phase (600 km/s). There was no similar magnetic variation at the foot point site (Dikson, Russia) on the ground of ERG satellite. However, we found the synchronous and large amplitude ULF wave on the Tixie (Russia, L=5.89). Tixie was located the east of ERG satellite. The ground magnetic field variations at Kuju, Davao and Canberra (these stations were located along the same longitude of Tixie) were different from the ULF wave at Tixie. In this study, we will examine the generation mechanism and propagation process of the simultaneous ULF wave observed on the ERG and the ground, and discuss the reason why the ULF waves are observed at the different local time.