

Comparison between Pc 5 pulsation on the ground and in the inner magnetosphere during the high-speed solar wind stream

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ULF waves in frequency band between 1.67 and 6.67 mHz, especially Pc 5 magnetic pulsations, are believed to contribute to Relativistic Electron Enhancement (REE) 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). Theoretically, the polarization (toroidal, poloidal or compressional modes) of the Pc 5 pulsations is discussed for the effectiveness of transporting radially energetic particles. Most of ground-based works focused on the activities of Pc 5 pulsations (e.g., amplitude or power), and they have rarely considered the polarization of Pc 5 pulsations because of difficulty to identify it by using only ground-based observations.

The purpose of this paper is a better understanding the relationship between the characteristic of Pc 5 pulsations observed on the ground and the polarization of Pc 5 pulsations in the inner magnetosphere. We compared Pc 5 pulsations observed on the ground with Pc 5 pulsations measured by Time History of Events and Macroscale Interactions During Substorms (THEMIS) under the high-speed solar wind conditions, 26-28 March 2008. The amplitude of Pc 5 pulsation shows a poor correlation between Pc 5 pulsation on the ground and in the inner magnetosphere. This result indicates that we need to demonstrate the characteristic and distribution of Pc 5 pulsation on the ground, corresponding to the Pc 5 pulsation in the inner magnetosphere.

We will discuss the availability of the ground Pc 5 pulsations for contributing to REE.