

Global resonance structure of Pc5 oscillations in the magnetosphere

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It is well known that the Pc5 geomagnetic pulsations contribute significantly to the acceleration of electrons captured in the geomagnetic field speeding them up to relativistic energies and transmuting them into a considerable danger factor for onboard electronic devices at spacecrafts. Details of wave-particle interaction giving rise to particle acceleration strongly depend on the wave field structure. From various kinds of Pc5, the most intense are global oscillations covering almost the whole magnetosphere. In this work we study resonance field structure of global low-frequency Pc5 oscillations of the magnetosphere which arise during the super-high-speed solar wind stream around the magnetosphere. For this purpose, we employ data analysis of measurements from global INTERMAGNET network, regional networks of magnetometers, as well as multipoint data from satellites orbiting in different parts of the near-Earth space. Latitudinal and longitudinal variations of resonance frequencies have been plotted, phase and group velocities of waves have been measured, and characteristic distribution of the oscillation intensity over the magnetosphere cavity has been revealed. The results obtained will help to better understand physical processes driving generation of global Pc5 and acceleration of relativistic electrons. The work was supported by RFBR grant 06-05-64143.