**Foreshock ULF waves observed by the MMS satellites and its magnetosphere response**

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In this work, the physical nature of geomagnetic Pc3-4 pulsations is investigated. On the one hand, many features of Pc3-4 pulsations are already well known from the works of such famous researchers as Troitskaya V.A., Guglielmi A.V. and others. But the launch of new satellite missions, such as MMS (Magnetospheric Multiscale Mission), allows us to take a more detailed look at the nature of this phenomenon.

Cases of observation of Pc3-4 pulsations using data from magnetometers of the CARISMA network (Canada, USA) are considered. For Pc3-4 pulsations, a resonance structure (FLR - field line resonance) was observed: an increase in the period with increasing geomagnetic latitude. Ground-based Pc3-4 pulsations are clearly visible in the toroidal component on the GOES-13 geostationary satellite located near the conjugate point. During the period of registration of Pc3-4 pulsations, the cone angle of the interplanetary magnetic field was less than 45°, which led to the formation of a quasi-parallel bow shock.

At this time, the MMS series satellites recorded monochromatic ULF waves in the foreshock region. Moreover, during the period when the MMS satellites moved from the foreshock region to the magnetosheath, this type of ULF waves was not clearly seen against the background of broadband variations of the magnetic field in the turbulent magnetosheath. Therefore, the magnetosheath is not a source of ULF waves that excite Pc3-4 pulsations. Apparently, there are transparency windows in the magnetosheath for the passage of ULF foreshock waves. When passing through a turbulent magnetosheath, the spectrum of ULF waves becomes more broadband, which leads to the formation of a resonant structure of Pc3-4 pulsations.