SIMULTANEOUS OBSERVATION OF DIFFUSE IONS AND ULF WAVES IN THE FORESHOCK, AND GROUND SURFACE GEOMAGNETIC PULSATIONS WITH UPSTREAM ORIGIN

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A specific group of upstream ULF waves are thought to be driven by diffuse ion population backscattered from the bow shock. The energy density of these ions is decreasing exponentially with the distance along the interplanetary magnetic field from the bow shock. The comparison of the decrease of particle energy density and the corresponding transversal wave energy density suggests that there are other parameters than the particles' energy governing the wave energy.

The dominant source of dayside ground Pc3-4 pulsations at mid and low-latitudes is inward propagating upstream wave activity. Hence Pc3-4 activity yields a possibility to continuously monitor upstream wave activity and can help to answer some still open questions. We present some comparative case studies of simultaneous foreshock and ground events observed by the CLUSTER satellites and the MM100 magnetometer chain, and interpret them in the light of statistical studies.

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