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Statistical study of foreshock processes observed by THEMIS

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The parameters of the solar wind plasma are modified upstream the Earth´s bow shock, in the ion foreshock region, which is typically observed at quasi-parallel bow shocks and is characterized by an enhanced level of ULF waves. These waves are created due to an interaction of the solar wind with the ions reflected at the bow shock. Consequently, fast magnetosonic waves are generated with an in–phase relationship between the ion flux and magnetic field fluctuations. Using multipoint observations of the THEMIS spacecraft located in the vicinity of the bow shock or in the foreshock, we present statistical maps of a modification of solar wind parameters due to foreshock processes (solar wind heating and deceleration, enhancements of the electric and magnetic field fluctuation level, etc.). A special attention was devoted to intervals of the radial interplanetary magnetic field orientation that would have create the foreshock upstream of the whole dayside bow shock.