



On the occurrence of mirror mode fluctuations in the terrestrial magnetosheath based on multipoint observations

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In January-April 2006, mirror type magnetic field fluctuations were often observed by the Cluster spacecraft in different regions of the terrestrial magnetosheath. Minimum variance analysis is applied to find those sections of the orbits when the magnetic field variations show the features characteristic for mirror mode waves for longer time intervals. Local plasma parameters are involved in the study to examine the anticorrelation between field strength and plasma density as well as the mirror instability threshold. Sudden and slower changes are sometimes observed in the type of the fluctuations simultaneously by all spacecraft at distant locations (~ 10 thousand km), while there are cases when mirror type activity stops at one location and continues in other regions. The reasons for these simultaneous and non-simultaneous changes are analysed by investigating the interplanetary magnetic field and solar wind measured by the ACE spacecraft and the plasma parameters provided by the Cluster satellites. A model was developed for determining the plasma flowlines from the bow shock to the observation point in order to study the effect of the quasiperpendicular bow shock.