The evolution of mirror type magnetic fluctuations in the magnetosheath based on multipoint observations

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Mirror type fluctuations were identified in the magnetic field data of the four Cluster satellites measured in different regions of the terrestrial magnetosheath. A few orbits are selected for this study when the separation between the spacecraft was large and mirror type fluctuations were observed at distant locations. Mirror mode structures are frozen in the plasma, they are convected from the bow shock to the inner regions of the magnetosheath if the source of the instability is somewhere around the shock. The growth rate of the field strength perturbation can be estimated by comparing the amplitudes of fluctuations observed simultaneously at distant locations which are approximately along the same plasma streamline. The direction of the plasma flow is determined by simulation based on actual plasma measurements. The obtained growth rate values are compared to those calculated from the numerical evaluation of the full kinetic dispersion relation (Gary et al.,1993).