

OBSERVATIONS OF DENSITY FLUCTUATIONS IN EARTH'S MAGNETOSHEATH WITH GEOTAIL AND WIND SPACECRAFT

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Large fluctuations of plasma densities in the earth's magnetosheath are examined with simultaneous measurements from the Geotail and Wind spacecraft. The fluctuations are found near a sector of the magnetosheath at local time 1500. The characteristics of the density fluctuations are large amplitudes ($\Delta N/N \sim 1$), long oscillation periods ($T \sim 30$ m) and anti-correlation between the plasma densities and the strengths of magnetic fields. Possibilities are considered that the density fluctuations are due to the traversal of the plasma depletion layer, the standing slow-mode waves in front of the magnetopause or the convected slow-mode waves generated at the earth's bow shock. Analyses of the observations find that the appearance of the density fluctuations is well associated with the variations of magnetic fields in the solar wind. It is also shown that the bulk flow speeds of plasmas are greater than the local propagation speeds of the slow-mode waves. These analyses suggest that the observed density fluctuations are not due to the traversal of the depletion layer or the standing slow-mode structure. The convected slow-mode waves generated at the earth's bow shock may be a good candidate, but there remain some features to be clarified with the theory.