



Cluster observations of large amplitude solitary waves in Earth's magnetotail

M. Berthomier (1), O. Le Contel (1), and L. Muschietti (2)

(1) Laboratoire de Physique des Plasmas, CNRS/X/UPMC, France (mbr@lpp.polytechnique.fr), (2) Space Sciences Laboratory, University of California, Berkeley, USA

Observations by the CLUSTER spacecraft of large amplitude fast solitary waves in Earth's magnetotail are presented. A detailed observational characterisation of the highly nonlinear structures is given in terms of amplitude, width, and velocity. Both electric and magnetic fluctuations are used in order to study the properties of the solitary waves. It is found, as expected from previous studies, that large amplitude structures can exist in the magnetotail in association with high level of field-aligned electron fluxes. An original large amplitude BGK model is developed in order to explain the observations. Multi-spacecraft observations are used in order to improve the diagnostic of these structures.