

# **Spatial structure of Langmuir wavepackets in the terrestrial foreshock**

**J. Soucek** (1), O. Santolik (2,1), T. Dudok de Wit (3), V. Krasnoselskikh (3), J. Pickett (4)

(1) Institute of Atmospheric physics, Prague, Czech Republic, (2) Faculty of Mathematics and Physics, Charles University, Prague, Czech Republic, (3) LPCE/CNRS, Orleans, France, (4) Department of Physics and Astronomy, University of Iowa, USA

In this work we investigated the properties of intense electrostatic waves at the plasma frequency observed in the Earth's foreshock region. These waves are excited by beams of energetic electrons reflected by the bow shock and they play an important role in the dissipation of beam energy. It is well known from previous observations that these waves appear in the form of short wavepackets and are strongly modulated on millisecond timescales. While the physics of these waves represents a longstanding research topic, very little direct experimental information is available on the spatial structure of the wavepackets. We addressed the problem using the multi-spacecraft observations of these waves by the WBD instrument of CLUSTER. Comparison of data from several satellites at short separation suggests that the packets are strongly structured in the direction perpendicular to the magnetic field and the transverse dimension of the waves is of the order of tens of kilometers. The spatial dimensions are in general comparable with the spacecraft separations or smaller, but we present several examples where, thanks to favorable configuration of the satellites, the same wavepacket was observed on multiple spacecraft.