Geophysical Research Abstracts, Vol. 7, 05917, 2005
SRef-ID: 1607-7962/gra/EGU05-A-05917

Acceleration and transport processes of foreshock diffuse ions: GEOTAIL contribution

T. Terasawa (1), T. I. Yamamoto (1), Y. Saito (2), and T. Mukai (2)
(1) Univ. Tokyo, (2) ISAS/JAXA

We present the results of GEOTAIL studies on the physical characteristics of diffuse protons in the foreshock region of the earth's bow shock. Firstly, we will discuss the nonlinear aspect of the acceleration process of diffuse ions:

(1) the low frequency MHD waves self-excited by these diffuse ions have a large amplitude (10-50% of the background field), and show various kinds of nonlinear wave phenomena, and
(2) the pressure exerted by the diffuse ions becomes non-negligible with respect to the solar wind ram pressure, and the internal structure of the bow shock transition region is modified by the existence of these ions ('Cosmic-Ray-Mediated' nature of the bow shock).

Secondly, we will talk about the spatial variation of acceleration efficiency as well as the transport process of the diffuse ions from the nose to the predawn and post-dusk upstream regions.