# MGS MAG/ER OBSERVATIONS AT THE MAGNETIC PILEUP BOUNDARY OF MARS: DRAPING ENHANCEMENT AND LOW FREQUENCY WAVES

C. Bertucci (1), C. Mazelle (1), D. Crider (2), D. Mitchell (3), K. Sauer (4), M. Acuña (2), J. Connerney (2), R. Lin (3), N. Ness (5) and D. Winterhalter (6)

(1) Centre d'Etude Spatiale des Rayonnements - CNRS/UPS, Toulouse, France (bertucci@cesr.fr), (2) NASA - GSFC, Greenbelt, USA, (3) SSL - University of California, Berkeley, USA, (4) MPAe, Klatenburg - Lindau, Germany, (5) Bartol Res. Inst., Newark, USA, (6) NASA - JPL, Pasadena, USA

The magnetic pileup boundary (MPB) is a sharp, thin, and permanent plasma boundary reported, at least, at comets and Mars, and located between the bow shock and the inner ionospheric boundary. The MPB separates the magnetosheath, where the wave activity is high, from the magnetic pileup region or magnetic barrier, where the interplanetary magnetic field piles up regularly around the planetary obstacle. We use magnetic field and electron plasma measurements from the MAG/ER experiment onboard the Mars Global Surveyor spacecraft to study two characteristic features of the MPB. The first feature is the sudden enhancement of the magnetic field line draping at the boundary. This new signature reveals that the MPB marks in fact the entry into the veritable induced magnetosphere, where the magnetic field topology is more regular, in opposition to what is observed in the magnetosheath. Secondly, we study the properties and the occurrence of compressive, linearly-polarized, low frequency waves, frequently observed on both sides of the boundary. An analysis of the correlation between the magnetic and the electron data reveals that on the upstream side the waves are mirror mode waves, while on the downstream side they are large amplitude, quasi-monochromatic fast magnetosonic waves. The presence of these two signatures enforces the idea that the MPB is a common feature for atmospheric/exospheric-solar wind interaction-type bodies.