Title: The Structure of the Martian Plasma Environment

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For a number of years a great deal of uncertainty has existed concerning the nature of the solar wind interaction at Mars, because of the lack of relevant plasma and field observations. However, measurements by the Phobos-2 and the Mars Global Surveyor spacecraft, with different instrument complements and orbital parameters, led to a significant improvement of our knowledge about the regions and boundaries surrounding Mars.

The main signatures, defined by the different plasma processes at work, can be summarized as follows:

(1) The bow shock stands off an effective obstacle at a distance expected from gas-dynamic and/or magnetohydrodynamic approximations.

(2) The Magnetic Pile-up Region (MPR) is a region dominated by planetary ions. The region is separated from the magnetosheath by the Magnetic Pile-up Boundary (MPB).

(3) A plasma boundary is observed in the supra-thermal electrons (> 10 eV, MGS data), which hints at the existence of a boundary between the MPR and the ionosphere below.

In this review the magnetosheath, the Magnetic Pile-up Region, and the Magnetic Pile-up Boundary will be discussed, as well as the observations of a possible ionopause.