



Ionospheric magnetic fields and currents at Venus and Mars.

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Venus Express spacecraft have provided us a wealth of in-situ observations of characteristics of induced magnetospheres of Venus at low altitudes during solar minimum conditions. At such conditions large-scale magnetic fields are observed deeply in the ionospheres (magnetized ionospheres). The arising magnetic field pattern occurs strongly asymmetrical. For example, in the ionosphere pointed in the direction opposite to the direction of the motional electric field in solar wind, the cross-flow component of the magnetic field changes sign. Asymmetry in the fields significantly modifies a plasma transport to the night side. We have found similar features at Mars while analyzing the magnetic field measurements made by Mars Global Surveyor. The VEX and MGS observations again raise a long-standing question about the origin of these fields in the magnetized ionospheres of Venus and Mars. The problem is intimately related to the issue of electric current system and their closure. We discuss different scenarios of the field origin.