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Modelling the solar wind-magnetosphere interaction at Mercury: characteristics of the plasma injection at the dayside magnetopause.

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Due to the next space mission *Messenger* (NASA) and *BepiColombo* (ESA), there is an increasing interest in modelling the Mercury's environment. The geometry of the magnetosphere, as well as, its response to the solar wind conditions, is one of the major issues. The small size of the magnetosphere and the increased weight of the IMF B_X component, introduce critical differences with respect to the Earth case, such as a strong north-south asymmetry, and the opening of the magnetosphere even for non-negative IMF B_Z.

We derived a magnetospheric model for Mercury starting form the *TH93* code. The model has been tuned to reproduce the key features of the Mariner 10 observations, and to mimic the magnetic field topology obtained by means of complex numerical simulations. On the basis of this *ad-hoc* model we analyse the effects of the magnetic reconnection on the precipitation of magnetosheath plasma, which it is expected to be one of the main sources of charged particles circulating inside the magnetosphere. Depending on the ratio between the Alfvénic speeds on both side of the magnetopause discontinuity, the reconnection process is able to accelerate ions up to tens of keV, which can in part hit the surface and contribute, via ion-sputtering, to the refilling of the planetary exosphere. Non-adiabatic effects progressively develop as the energy gained by injected particles increase.