

## Prediction of differential fluxes of plasmas in the near-Mercury space

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As is well known, Mariner-10 discovered the presence of the intrinsic magnetic field which was strong enough to stand off the solar wind well above its surface under usual conditions. Thus the Mercury has its own magnetosphere and bow shock, which is apparently analogous to the terrestrial counterparts. Mariner-10 also detected the occurrence of bursty enhancements of energetic electron fluxes, as is similar to the terrestrial substorms at the geosynchronous altitude, but with a time scale much faster than in the terrestrial case. We speculate, however, that the Hermean magnetosphere may be quite different from that of the earth in various points, for example, the absence of atmosphere and ionosphere, the large occupation of the planetary body in the magnetosphere, and meso-scale plasma processes which are expected to play essential roles in the structure and dynamics of the Hermean magnetosphere. Furthermore, owing to its proximity to the sun with the perihelion of 0.31 AU and the aphelion of 0.47 AU, a wide range of variations in the solar wind parameters and the solar activity such as solar flares are expected to cause highly violent situations in the plasma environment. In several percents of times, the magnetopause is expected to be located close to, or less (?) than the planetary surface.

The Mariner-10 observations were done only by flybys, and they provided only data of the magnetic field and electrons in a limited energy range. Now the Mercury Magnetospheric Orbiter (MMO) is planned as a key element of the BepiColombo mission to explore the Hermean magnetosphere and its surrounding interplanetary space. For design of the plasma instruments on board MMO, we predict differential fluxes of electrons and protons in the near-Mercury space, based on the Mariner-10 data and the Helios 1 and 2 data. Helios results are used for considering the solar wind parameters in the inner heliosphere. Conditions imposed on the design of the plasma instruments are also discussed.