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The large-scale dynamics of Mercury's magnetosphere

Jun Zhong
Institute of Geology and Geophysics, Chinese Academy of Sciences, China (j.zhong@mail.iggcas.ac.cn)

Mercury's comparatively weak intrinsic magnetic field, together with the strong solar wind forcing in the inner heliosphere, creates a mini-magnetosphere. The planet's small physical dimensions and lack of an ionosphere contribute to a very brief Dungey cycle, about 2 min on average, which governs the time scale for internal plasma circulation. The greater interplanetary magnetic field magnitude and higher Alfvén speed in the inner solar system than that at Earth makes magnetic reconnection play a dominant role in Mercury's great dynamic magnetosphere. In this talk, I will summarize and discuss the current observations and understanding of the large-scale dynamics of Mercury's magnetosphere. Special emphasis will be placed upon: 1) The shape and dimensions of the Mercury's magnetosphere and its variations; 2) Possibility of solar wind impact the planet; and 3) The nature of the magnetic reconnection in Mercury's space environment. The characteristic spatial and temporal timescales for dynamics will be compared to the Earth.