



Multiscale magnetic turbulence at Mercury

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A set of statistical-physical tools is used to investigate multiscale magnetic field fluctuations recorded by MESSENGER spacecraft in the near-Mercury space environment, with the emphasis on key boundary regions participating in the solar wind - magnetosphere interaction. The analysis reveals the presence of a highly turbulent and extended foreshock system filled with packets of ULF oscillations and active current sheets, broad-band intermittent fluctuations in the magnetosheath, ion-kinetic turbulence in the central plasma sheet of Mercury's magnetotail, and kinetic-scale fluctuations in the inner current sheet encountered at the outbound (dawn side) magnetopause. The obtained statistics suggest that turbulence at this planet is strongly affected by non-MHD effects introduced by finite sizes of cyclotron orbits of the constituting ion species. Physical mechanisms of these effects and their influence on the structure and dynamics of Mercury's magnetic field remain to be clarified.