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Mercury's magnetosheath fluctuations studied with wavelet analysis

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Mercury has a magnetosphere and as a consequence of the interaction with the super-magnetosonic solar wind, a bow shock is formed upstream of the planet. The shocked, heated, and decelerated solar wind particles populate the magnetosheath region between the planetary bow shock and magnetopause. Here we use the Mariner-10 spacecraft highest resolution magnetic field data (25 vectors/s) during both M-I (29 March 1974) and M-III (16 March 1975) Mercury encounters to study the magnetosheath fluctuations. Wavelet techniques are employed to identify the main scales/frequencies of magnetic field fluctuations and their evolution in time (non-stationarity). Wavelet spectra during magnetosheath crossings with quasi-perpendicular and quasi-parallel bow shocks are also comparatively analyzed. We have found that magnetic field fluctuations are strongly non-stationary, with frequencies around 5-10 s, 20-40 s and 2-5 minutes.