

Short-term observations of double peaked Na emission from Mercury's exosphere

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Analysis of a sequence of short-term ground-based observations of the Na emission from the exosphere of Mercury, recorded during three consecutive days (June 7-9, 2012), is presented. We observed a stable double-peak pattern where the exospheric Na emission was confined close to the nominal magnetospheric cusp footprints. During a series of scheduled observations of the global Na emission from the THEMIS telescope, achieved by scanning the whole planet's disc, we performed some extra measurements by recording the Na emission from a narrow North-South strip only, centred above the two Na emission peaks. When possible, these complementary measurements were recorded when the NASA Messenger spacecraft, orbiting around Mercury, was outside the planet's magnetosphere, in order to have contemporary in-situ data of the unperturbed interplanetary magnetic field. Our aim was to inspect the existence of short-term variabilities, which were never been reported before from ground-based observations, and their possible relationship with IMF variations. In spite of the fact that Mercury possess a miniature magnetosphere, characterized by fast reconnection events that develops on a timescale of few minutes (1-3 min), ground-based observations show that the exospheric Na emission pattern can be globally stable for a very prolonged period (some days), but it seems it can also shows variations in the time range of tens of minutes. In specific, we observed a decrease of the South/North ratio due to the decrease of the Na release from the southern cusp with respect to the northern one. This event lasted for about one hour, within several minor in-phase variations that involved both hemispheres.