A Statistical Study of Sodium Intensity and Dynamics in the Exosphere of Mercury

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The exosphere of Mercury is a complex system whose composition and dynamics are the effect of coupling between surface and the external environment, under the influence of the planet's magnetic field. Hence, solar wind particles and photons, meteoritic impacts and interplanetary magnetic field have an influence on the morphology, content and time evolution of this tiny gaseous envelope.
Since the discovery of the sodium component in the Hermean exosphere in 1985, many observations have been performed that have evidenced a strong variability with time, in both emission intensity and appearance/ disappearance of localized peaks of emission. They may appear at mid-latitude in both hemispheres, or localized only in one hemisphere. A correlation with the interplanetary magnetic field orientation has been supposed, as it seems to be confirmed by observed relationships between the IMF Bx component and the peak position. This result may imply that preferential precipitation of solar wind protons in one of the two planetary magnetic cusps drives this asymmetric behaviour .
Recently, Kameda et al. (2009) found a correlation between the sodium emission intensity and the position of Mercury with respect to the interplanetary disk of dust that is supposed to exist on the ecliptic plane. By using a wide set of data taken during three years of Mercury sodium observation from the THEMIS solar telescope in the Canary Islands, we intend to corroborate the Kameda et al. results. Moreover, we speculate about the possibility that the planet's location with respect to this disk could be related to the appearance of sodium asymmetries.