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The time evolution of the sodium exosphere of Mercury

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Abstract

A collaborative project on the long-term monitoring of the sodium exosphere of Mercury by ground-based observations and numerical simulations has been recently established between National Central University and Rikkyo University. We are particularly interested in comparing the ground-based observations of time variability of Mercury's sodium emission with the solar wind events with a view to study the possible effects of the solar particles on the surface production rate of the sodium atoms. Besides the measurements from the 40 cm telescope at Haleakala Observatory, Hawaii, we are also using observational data from spacecraft missions like SOHO and STEREO. At the present moment, we are investigating the connection between a sodium cloud event in the wake region of Mercury as detected at 04:56 (UT) on March 26 at Haleakala and possible coronal mass ejection (CME) events impacting on Mercury. Numerical model calculations will be performed to evaluate the morphology of the enhanced sodium exosphere and sodium cloud as functions of time.