

CONTROL ID: 2365271

TITLE: Mercury's exosphere: New detections, discoveries, and insights

ABSTRACT BODY:

Abstract (2,250 Maximum Characters): For over 16 Mercury years, the MESSENGER spacecraft orbited the planet Mercury and conducted a variety of observations of the exosphere. Part of the overall observing plan was a search for exospheric species that are less abundant and/or more weakly emitting than the more easily observed Na, Ca, and Mg. For most of the orbital phase, this search has resulted in nothing more than increasingly refined upper limits. However, in the last few Mercury years, three species that had eluded this programmatic search were observed. Emission from multiple lines of Ca^+ was detected, validating the observation of a single line of Ca^+ during the third MESSENGER Mercury flyby. Multiple lines of Al were also detected, providing definitive evidence for a species that has been suggested from ground-based observations. Finally, emission from Mn has been discovered, adding another member to the pantheon of exospheric species. All these detections were somewhat localized about the planet and during the Mercury year. Equally interesting as these observations is absence of detectable emission from other species, such as O. We will report on both the detections and non-detections, provide altitude profiles where possible, and discuss the insights gained from these species in the context of the overall exosphere. The NASA MESSENGER Participating Scientist Program supported this work.

CURRENT CATEGORY: Mercury

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