



Mars atmospheric loss to space: Observations of present-day loss and implications for long-term volatile evolution

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MAVEN completed its first Mars year of science mapping in October 2016. Results show loss of gas to space by multiple processes, including solar-wind pick-up, sputtering, photochemical loss, and thermal escape, along with their responses to changing solar and solar-wind boundary conditions and to discrete solar events. By understanding the current loss rates and the processes controlling them, we are able to examine the long-term loss to space, including the effects of different solar conditions early in history; in addition, we are able to use stable-isotope ratios to derive the integrated loss to space through time. Preliminary results suggest that loss to space was a dominant, if not the dominant, mechanism that drove the changing climate through time. We will present a framework for analyzing and interpreting the results, along with preliminary results on the extrapolation to long timescales.