

The Many Potential Influences of Solar Activity on Atmosphere Escape from the Terrestrial Planets

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Abstract

It is worth stepping back to reconsider the contrasts between Venus, Earth and Mars atmosphere escape processes, and how the Sun affects each of them. This topic bears on both present day escape rates and measurements, as well as on evolutionary effects. In particular, we have just been through one of the most prolonged quiet solar activity periods on record. We offer some thoughts on both what has been observed, as well as open questions related to the solar cycle's control of escape rates. Our discussion emphasizes what we know about the combined solar radiation and interplanetary conditions from modern measurements over the last 3 sunspot cycles. Among the inescapable challenges for making progress is better characterization of historical solar activity including interplanetary consequences. The prospects for future study of these effects must involve both measurements and modeling.

