

Distant ionospheric photoelectron energy peak observations at Venus

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Abstract

The Venus ionosphere at the top of the planet's thick atmosphere is sustained by photoionization. The consequent photoelectrons may be identified by specific peaks in the energy spectrum at 20-30 eV which are mainly due to atomic oxygen photoionization. The ASPERA-4 electron spectrometer has an energy resolution designed to identify the photoelectron production features. Photoelectrons are seen not only in their production region, the sunlit ionosphere, but also at more distant locations in the Venus environment. Here, we present a summary of the work to date on observations of photoelectrons at Venus, and their comparison with similar processes at Titan and Mars. We expand further by using data from the distant photoelectrons measured at Venus to determine the ion escape rates from Venus during these intervals and then compare these escape rates with rates measured elsewhere in the solar system. In this comparison, we find a remarkable grouping of escape rates for planets, moons and comets.