

Investigating the Lunar Na Exosphere by Ion Mass Spectrometry

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The processes generating the lunar exosphere have been intensively and controversially debated in the past. We address how in-situ mass spectrometric measurements can complement optical methods to answer some of the current unresolved questions. Mass spectrometers come into play when neutral atoms originating from a satellite become ionized, couple to the solar wind through its embedded interplanetary magnetic field (IMF) and are then convected away with the solar wind. Such ions, also termed pick-up ions (PUI), can be used to reconstruct the distribution of neutrals from the measured pick-up ion spectra. We show how one can use PUI's to extract the parameters which describe the exosphere in the case of the well observed lunar Na exosphere. We discuss the chance of upcoming lunar fly-bys to observe other pick-up ion species.