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# Response of the Lunar Exosphere to magnetospheric plasma: Correlation of telescopic observations to concurrent Lunar Prospector in-situ data

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We have used Lunar Prospector data to study the response of the lunar exosphere to plasma when the Moon traverses the terrestrial magnetosphere. Direct evidence of the importance of ion sputtering as an exospheric source is provided for the first time. A published series of ground-based observations of the lunar sodium emission were obtained while Lunar Prospector was in orbit around the Moon (Potter et al., 2000). Results from this analysis indicate that the variability of the observed column density correlates to the total electron flux measured by Lunar Prospector, which is a proxy for the ion sputtering flux. Additionally, the observed sodium temperature is regulated by the measured flux of energetic electrons (>3 keV) suggesting heating during crossings of the Earth's central plasma sheet. Implications for the constraining of the ion sputtering source in future modeling will be discussed.