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Morphology of meteoric plasma layers in the ionosphere of Mars as observed by the Mars Global Surveyor Radio Science Experiment

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A layer of plasma near 90 km altitude has been sporadically observed in the martian ionosphere by the Mars Global Surveyor (MGS) Radio Science (RS) instrument. This sporadic layer has been attributed to meteoroid influx. It is below the layers formed by photoionization by typical solar EUV and X-ray irradiances. The meteoric layer has been observed in 71 of 5600 MGS profiles. We will report average values and ranges for the altitude, width, and peak electron density of this layer. These physical characteristics will be compared to published predictions. Theoretical simulations by Molina-Cuberos et al. (2002, Planetary and Space Science, 51, 239-249) predicted a meteoric layer altitude of 85 km, width of 20 km, and peak electron density of 1E4 cm-3. Theoretical simulations by Pesnell and Grebowksy (2000, Journal of Geophysical Research, 105, 1695-1707) made similar predictions, except for a slightly lower altitude of 80 km. Trends in these physical characteristics with season and time of day will also be reported.