



## **Phoenix Mass Spectrometer: New values for the near surface relative humidity and water vapor pressure**

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We have obtained new values for the near surface relative humidity (rh) and water vapor pressure (e) from the analysis of the Phoenix Mass Spectrometer measurements on Sols 9, 11, 12 and 16. Measurements of near surface rh were previously performed at polar latitudes by the TECP instrument aboard the Phoenix lander, and currently at equatorial latitudes by the REMS instrument aboard Curiosity. However, the humidity-related TECP measurements were pulled from the NASA Planetary Data System due to some uncertainties in the original calibration and have not been posted again.

Our preliminary results indicate values for e around 10 Pa during the daytime, and up to 1 Pa at night. These values are unexpectedly high, as previous measurements done by the TECP showed daytime values around 1.5 Pa, and nighttime values around 0.01 Pa. The implications of near surface values of e in the range 1-10 Pa are of paramount importance. First, the rh could reach higher values than previously expected, which facilitates the formation of liquid brines on the surface and in the shallow subsurface. Second, in order to match orbital measurements of the water column abundance with our values of the near surface e, it cannot be assumed that the vertical profile of the water vapor mixing ratio is constant in the first few kilometers. Instead, there must be an excess of water vapor near the surface, which is caused by the interchange of water vapor with the soil.

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