WATER VAPOR OVER MARTIAN NORTH POLAR CAP FROM MGS TES. A. Pankine[1], L. Tamppari[1] and M. Smith[2], [1]Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109, [2]NASA/Goddard Space Flight Center, Greenbelt, MD.

Summary: We present retrievals of water vapor abundances from MGS TES data over Martian north polar cap during spring and summer. Previous retrievals [1] were limited to areas with surface temperatures above 220 K due to poor thermal contrast between the surface and atmosphere at lower surface temperatures. The surface temperatures of the CO_2 frost and of the water ice making up the north polar cap are below that threshold. However, over some areas of the north poar cap during spring and summer the atmospheric temperatures are high enough to provide sufficient thermal contrast with the cold surface for a reliable water vapor retrieval. Same water vapor spectral features as in [1] , namely several bands in the spectral range from ~250-400 cm^{-1}, are used in the new retrieval. In contrast to the previous analysis [1] these spectral features are observed in emission in the MGS TES spectra.

We will present polar maps of the water vapor column abundances in the north polar region extending over the polar cap and discuss the observations. Observations of the water vapor over the north polar cap are important because they help to quantify the mechansims responsible for the introduction of the water vapor into the polar atmosphere. There are indications that water vapor is released from the cap in the from of local and short-lived outburtst [2] and that water ice sublimation rates can vary across the north polar cap [2], with rates dependant not only on the surface temperature, but also on near-surface winds. Observations of the water vapor outbursts in the north polar regions are also importnat test cases for observations of plumes of trace gases (for example, from hypothetical hydrothermal vents) at other locations on Mars.

References: [1] Smith M. (2002) *JGR, 107,* 5115. [2] Pankine A. et al. (2008) *Icarus,*submitted.