

AN OVERVIEW OF TES POLAR OBSERVATIONS TO DATE. H.H. Kieffer, T. Titus, K. Mullins, *Geological Survey, Flagstaff, AZ 86001, USA*, P.R. Christensen, *Geology Department, Arizona State University, Tempe, AZ 85287, USA*.

The Thermal Emission Spectrometer (TES) has made observations of the Martian polar regions over the last three years. These observations are a combination of low resolutions scans (aerobraking observations of the south pole) and high resolution “noodles” (aerobraking observations of the north pole and all mapping phase observations). This review summarizes important results to date [1,2], which include:

- Both polar caps are mostly dark ice (not frost) prior to exposure to solar insolation.
- The asymmetric recession of the south polar cap is dominated by albedo variations, especially the Cryptic region, which remains a dark slab of CO₂ throughout its sublimation.
- Seasonal cap appearance is largely determined by

frost grain size. The geographic patterns repeat each year.

- Cold spots observed during the northern winter are a spectral-emissivity effect mainly due to surface accumulation of fine-grained frost or snow; their kinetic temperatures are not exceptional.
- Cold spots are concentrated near topographic features, eg. craters, chasma, and slopes of the perennial cap.
- Mapping data has constrained the characteristic time scales of cold spot formation and dissipation during the polar night; both are a few days.

References: [1] Kieffer et al., *Jour. Geophys. Res.*, in press, 2000. [2] Titus et al., manuscript in preparation.