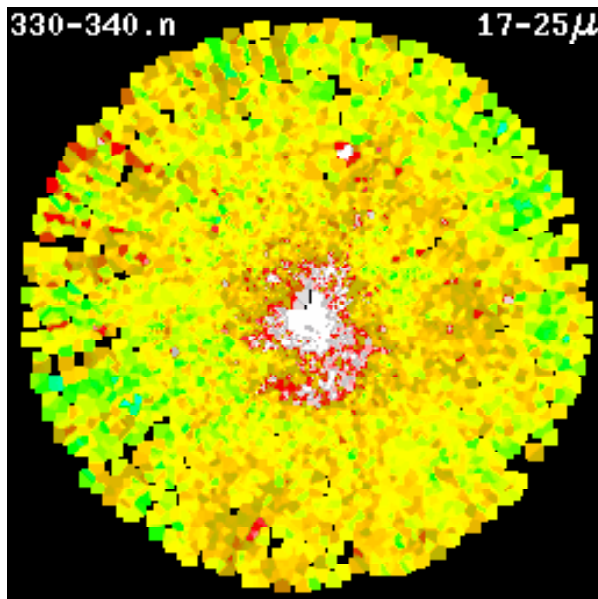
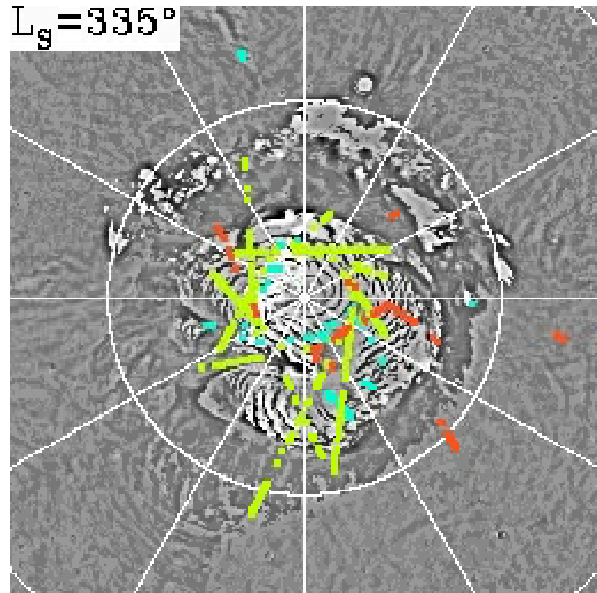


CO<sub>2</sub> clouds in the Martian polar night have been monitored (1,2) by the Mars Global Surveyor (MGS) Laser Altimeter experiment (MOLA) and used to create a catalog of cloud locations and morphologies spanning the period from March 1998 to July 2001. For much of that time, the MGS Thermal Emission Spectrometer experiment (TES) viewed Mars from the same nadir direction as MOLA at wavelengths between 5.8μm and 67μm. Following the method of Titus and Kieffer, (3) polar nighttime TES measurements have been interpolated to 15μm, 17μm, and 25μm wavelengths, representing emission dominated, respectively, by the atmosphere at about 20±5 km altitude, by the lowest scale-height above the surface, and by the surface itself. The MOLA cloud catalog has been combined with TES measurements to create maps of emission temperature when MOLA clouds were not observed, at 10° intervals in L<sub>s</sub>. The cloud catalog was used again to determine emission temperatures at those times when MOLA and, by inference, TES were observing clouds. The average temperature difference in the presence and absence of clouds is significant at both 17μm and 25μm, but not at 15μm.



**Fig 1.** Difference between 17μm and 25 μm TES measurements in the northern polar winter, 70°<L<sub>s</sub><80°, excluding MOLA clouds.



**Fig 2.** Clouds detected by MOLA in the northern polar winter, 335°<L<sub>s</sub><340°. Color denotes morphology: blue: stationary; yellow: propagating; red: diffuse.

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