

## MARS DUST STORM AND NON-THERMAL CO<sub>2</sub> EMISSION

Observations of Mars were made by the Goddard heterodyne group consisting of T. Kostiuk, T. A. Livengood (Challenger Center), Juan Delgado (U MD), W. Maguire, J. Pearl, M. Smith, D. Buhl, K. E. Fast, J. Annen, F. Espenak, F. Minetto, P. Rozmarynowski, F. Schmuelling (NAS/NRC, U Cologne), T. Hewagama (U MD), J. J. Goldstein (Challenger Center). They used the newly developed Heterodyne Instrument for Planetary Wind And Composition (HIPWAC), a 10 micron heterodyne spectrograph at the cassegrain focus of the IRTF. This instrument provides  $1 \times 10^{-7}$  spectral resolution (resolving power of  $10^6$  at 10 microns), spectral coverage of 9-12 microns, and an angular resolution of 1 arcsec.

The observations shown here were coordinated with Mars Global Surveyor TES Measurements, Aug. 1- 4, 2001, and they provide complementary data for Mars Global Surveyor Mission by directly probing the mesosphere of Mars (50-100 km). They show the changing altitude of the global dust storm and permit a better interpretation of Thermal Emission Spectrometer (TES) detection of mesospheric non-thermal CO<sub>2</sub> emission.

Results were present at the 33<sup>rd</sup> DPS meeting (T.A. Livengood et al. "Measurements of the Non-Thermal Emission Lines of Carbon Dioxide in the Mars Upper Atmosphere", BAAS, 33, 1122). Complementary TES data were presented by W.C. Maguire et al. "Observations of High Altitude CO<sub>2</sub> Hot Bands on Mars by the Orbiting Thermal Emission Spectrometer", BAAS, 33, 1122.

The figure shows the data obtained and the relatively high angular and spectral resolution obtained with HIPWAC. This high spectral resolution complements spacecraft work.

**By agreement with the PI, T. Kostiuk, HIPWAC is available to the community on a collaborative basis.**