

### A new look at the Viking IRTM cloud signature

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Recent Hubble Space Telescope (HST) imaging of Mars has suggested (Clancy et al., 1996) that Mars is cloudier now than during the Viking era. This increased cloudiness, during Mars northern spring/summer seasons, is consistent with ground-based microwave measurements (op cit) showing a colder Mars atmosphere during these seasons than during the Viking era. Our ongoing analysis of infrared Thermal Mapper (IRTM) data, however, indicates that clouds were present, though perhaps at higher altitudes, during the Viking northern spring/summer periods.

The Viking RTM 11 and 20  $\mu\text{m}$  brightness temperatures have been differenced, as done by Christensen and Zurek (1984), to identify the spatial and temporal extent of Martian atmospheric water ice clouds. Preliminary cloud distributions will be presented. A delta-Eddington radiation algorithm has been used to identify cloud opacity and temperature combinations that give the appropriate signature. Resulting cloud characteristics will be discussed. Viking era cloud cover for the Mars Pathfinder landing site (19N/33W) will also be shown.

Our analysis will provide a baseline for comparison with upcoming Earth-based and spacecraft data. In particular, the spectral differencing technique can be applied to observations by the Mars Global Surveyor Thermal Emission Spectrometer (TES) and the Mars Surveyor 1998 Pressure Modulator IR Radiometer (PMIR). The frequency and duration of Martian clouds during these different missions will augment the Earth-based monitoring and provide a detailed characterization of the Martian interannual climate variation.

### References

- Christensen, P. R. and R. W. Zurek, *J. Geophys. Res.*, June 1984.  
Clancy, R. T., et al., *Icarus*, July 1996.