

Tuesday, November 11, 2008

WATER, CLOUDS, AND DUST: DUST AND CLOUD OBSERVATIONS

2:48 – 6:00 p.m.

**Chairs:** M. J. Wolff  
M. Mischna

Whiteway J. \* Dickinson C. Cook C. Komguem L. Illnicki M. Popovici V. Seabrook J. Daly M. Carswell A. (**Invited, 20 minutes**)

[\*Phoenix Lidar Measurements of Atmospheric Dust and Clouds\*](#) [#9027]

The lidar on the Phoenix mission measured the vertical distribution of dust and clouds in the atmosphere of Mars. The presentation will focus on the observed clouds and the analysis to estimate ice water content.

Davy R. \* Pathak J. Taylor P. A. Weng W. Whiteway J.

[\*On Modeling Boundary-Layer Depths, Dust and Cloud at the Phoenix Lander Site\*](#) [#9080]

A 1-D coupled atmospheric boundary-layer model and Mars microphysical model have been used to investigate atmospheric dust and water-ice distributions at the Phoenix lander site with application to the interpretation of LIDAR results.

Stenzel O. J. Hoekzema N. M. Markiewicz W. J. Keller H. U. (**1-minute poster summary**)

[\*Correction of HRSC Images for Atmospheric Dust Using a Simple Optical Depth Retrieval Method\*](#) [#9112]

A simple scheme is introduced to estimate the optical depth present in the martian atmosphere during a Mars Express HRSC observation.

**3:30 – 4:00 p.m. BREAK**

Cantor B. A. \* Malin M. C. Wolff M. J. Haberle R. M. James P. B. Clancy R. T. Lee S. W. MARCI Science Team (**Invited, 20 minutes**)

[\*Observations of the Martian Atmosphere by MRO-MARCI, An Overview of 1 Mars Year\*](#) [#9075]

MRO-MARCI provides another opportunity to study martian weather phenomena, ranging from dust devils and dust storms to condensate clouds to ozone to the seasonal behavior of the polar caps, all on time scales ranging from diurnally to interannually.

Heavens N. G. \* Richardson M. I. McCleese D. J. Kleinböhl A.

Mars Climate Sounder Science Team (**Invited, 20 minutes**)

[\*A New Perspective on the Vertical Distribution of Dust in the Martian Atmosphere in Northern Summer from Mars Climate Sounder: Zonally-averaged Profiles\*](#) [#9065]

This study will discuss zonally averaged profiles of dust opacity retrieved from observations by Mars Climate Sounder, their novel features, and summarize their compact representation for purposes of analysis and prescribed dust forcings in meteorological models.

Clancy R. T. \* Wolff M. J. Whitney B. A. Smith M. D. Cantor B. A.

[\*High Altitude Dust Global Distribution, Vertical Mixing, and Particle Sizes During the 2001 Planet-encircling Dust Storm\*](#) [#9084]

Dust was suspended to altitudes as high as 80 km during the 2001 dust storm, exhibiting extreme longitudinal variations, altitude increasing mixing ratios, and  $\approx 1.5 \mu\text{m}$  particle radii. These indicate vigorous vertical and meridional transport rates at 40–80 km altitudes.

OMEGA Team Vincendon M. \* Langevin Y. Poulet F. Pommerol A. Wolff M. J. Bibring J.-P. Gondet B. Jouglet D.

[\*Albedo Changes on Mars: The Role of Dust Aerosols as Seen by OMEGA\*](#) [#9058]

We have studied the apparent variations of low albedo surfaces using OMEGA near-IR data and a radiative transfer model. Changes are primarily due to aerosols while dust deposits play only a minor role.

Wolff M. J. \* Clancy R. T. Smith M. D. Arvidson R. E. Kahre M. Seelos F. IV  
Morris R. V. CRISM Science Team

[Wavelength Dependence of the Dust Aerosol Single Scattering Albedo as Observed by MRO/CRISM](#) [#9125]

The very dusty martian atmosphere during the 2007 perihelion season offers an excellent opportunity to revisit the microphysical nature of dust aerosols through the use of CRISM “emission phase function” sequences.

Gondet B. \* Bibring J.-P. Langevin Y. Poulet F. Montmessin F. Forget F.

[Martian Clouds Detected by OMEGA/Mars Express](#) [#9046]

H<sub>2</sub>O and CO<sub>2</sub> clouds are major contributors to the global atmospheric circulation processes. Through the monitoring of their evolution over martian years, OMEGA contributes to understand the microphysics involved.

Määttänen A. \* Montmessin F. Gondet B. Hoffmann H. Scholten F. Hauber E.

Bibring J.-P. Neukum G.

[Equatorial CO<sub>2</sub> Clouds on Mars: OMEGA and HRSC Data Analysis](#) [#9005]

In this study we have used observations by MEx/OMEGA and MEx/HRSC to analyse equatorial CO<sub>2</sub> cloud occurrences as well as some properties of the clouds (altitude, particle size, opacity). We will present the results acquired so far using the two datasets.

Määttänen A. Fouchet T. Forni O. Forget F. Savijärvi H. Melchiorri R. Langevin Y. Gondet B.

Formisano V. Giuranna M. Bibring J.-P. **(1-minute poster summary)**

[A Study of Dust Properties from a Dust Storm Seen by MEx/OMEGA and MEx/PFS](#) [#9004]

Our project aims at providing new constraints on the optical properties of martian dust using observations of a local dust storm observed by OMEGA and PFS aboard the Mars Express spacecraft.

Vincendon M. Langevin Y. Bibring J.-P. Fouchet T. Gondet B. Jougllet D.

Poulet F. **(1-minute poster summary)**

[The Vertical Structure of Martian Aerosols Explored Using a 3D Spherical Monte-Carlo Model and Observations at the Terminator by OMEGA](#) [#9059]

We present a spherical model of radiative transfer through airborne particles based on Monte-Carlo methods. We analyze OMEGA observations at the day/night limit to study the vertical distribution of aerosols (water ice layers, dust scale height).

Heavens N. G. Richardson M. I. McCleese D. J. MCS Science Team **(1-minute poster summary)**

[A New Perspective on the Vertical Distribution of Dust in the Martian Atmosphere During Northern Summer from Mars Climate Sounder: Elevated Maxima in Density-scaled Opacity over the Tropics](#) [#9066]

This study investigates the longitudinal variability and origins of a persistent elevated maximum in density-scaled dust opacity (a proxy for mass mixing ratio) over Mars’ tropics during northern summer.

McConnochie T. H. Smith M. D. **(1-minute poster summary)**

[Vertically Resolved Aerosol Climatology from Mars Global Surveyor Thermal Emission Spectrometer \(MGS-TES\) Limb Sounding](#) [#9114]

We present a new aerosol data set based on TES limb-sounding observations.