

Monday, November 10, 2008
MARS GENERAL CIRCULATION AND CLIMATE: MODELS (continued)
2:00 –3:30 p.m.

Chair: L. Montabone

Medvedev A. S. * Kuroda T. Hartogh P. Takahashi M.

[*Semiannual Oscillations in the Atmosphere of Mars*](#) [#9047]

We detect the semiannual oscillation (SAO) in the difference between the day- and night-time MGS temperatures, a good proxy for solar tides, and simulate it with a GCM. Our analysis revealed significant differences in driving mechanisms of the SAO on Mars and Earth.

Lawson W. G. * Richardson M. I.

[*Ensemble-based Data Assimilation with Mapping Datasets of the Martian Atmosphere*](#) [#9115]

A progress report on our effort to develop an ensemble-based data assimilation system suitable for use with the datasets and models typically studied by planetary atmospheric scientists.

Lewis S. R. * Montabone L. Read P. L. Rogberg P. Wilson R. J. Smith M. D.

[*Data Assimilation of Three Mars Years of Thermal Emission Spectrometer Observations: Large-Scale Transient and Stationary Waves*](#) [#9009]

Large-scale planetary waves are diagnosed by assimilating Thermal Emission Spectrometer (TES) temperature profile and total dust opacity retrievals into a Mars general circulation model to produce a physically self-consistent record of all atmospheric variables.

Wilson R. J. * Lewis S. R. Montabone L.

[*Thermal Tides in an Assimilation of Three Years of Thermal Emission Spectrometer Data from Mars Global Surveyor*](#) [#9022]

We present highlights of an analysis of the diurnally-varying components of temperature, surface pressure and near-surface winds present in the MGS reanalysis derived from TES temperature retrievals using the UK-MGCM assimilation model.

Zalucha A. M. * Plumb R. A. Wilson R. J.

[*A Mechanism for the Effect of Topography on the Martian Hadley Cells*](#) [#9061]

Previous studies have shown that the north-south slope in the martian topography is the cause of the asymmetry of the Hadley cells about the equator. We use a simple MGCM and Lindzen and Hou's (1988) Hadley cell model to provide an explanation.

Rogberg P. Read P. L. * Lewis S. R. Montabone L.

[*Assessing Atmospheric Predictability on Mars Using Numerical Weather Prediction and Data Assimilation*](#) [#9062]

A study of atmospheric predictability on Mars on timescales up to 30 sols, using initial states derived from assimilated observations of Mars from Mars Global Surveyor.

Martinez-Alvarado O. Moroz I. M. Read P. L. Lewis S. R. Montabone L. **(1-minute poster summary)**

[*A Diagnosis of Low-Order Dynamics in the Atmosphere of Mars*](#) [#9048]

The hypothesis of low-order behaviour underlying the martian atmospheric dynamics is explored by proper orthogonal decomposition (POD) and Fourier analysis, identifying POD-modes and components of motion such as thermal tides and transient waves.

Ogohara K. Satomura T. **(1-minute poster summary)**

[*Effects of CO₂ Condensation on Meridional Mass Flows in the Winter Polar Region*](#) [#9021]

Impacts of mass deposition due to CO₂ condensation on the zonal mean circulation are examined by a MGCM. The increase of meridional wind concentrates near the surface in high latitudes and is associated with Ekman transport in the boundary layer.

Sabato J. S. Rafkin S. C. R. **(1-minute poster summary)**

[Eddy Driven Monsoon Theory Applied to Mars](#) [#9129]

The apparent discrepancy between the near-conservation of angular momentum (a property of zonally symmetric flows) and the strong, zonally asymmetric nature of Mars' general circulation is examined.

Rogberg P. Read P. L. Lewis S. R. Montabone L. **(1-minute poster summary)**

[Potential Vorticity, Angular Momentum and Inertial Instabilities in the Martian Atmospheric Circulation from Assimilated Analyses of MGS/TES](#) [#9104]

Data based on re-analyses of the MGS/TES observations have been used to map distributions of potential vorticity and axial absolute angular momentum. Distribution of angular momentum and potential vorticity are closely related to the zonal-mean circulation.

Mlawer E. Eluszkiewicz J. Cady-Pereira K. Iacono M. J. Moncet J.-L. **(1-minute poster summary)**

[Radiative Transfer Modeling of the Martian Atmosphere](#) [#9089]

The status of AER's radiative transfer tools applicable to the modeling and remote sensing of the Mars atmosphere will be described.

Eluszkiewicz J. Flittner D. E. Moncet J.-L. Wolff M. J. **(1-minute poster summary)**

[Development of Limb-scattering Radiative Transfer Models for Mars Remote Sensing and Data Assimilation](#) [#9031]

The development of limb-scattering models for MCS, TES, and CRISM is outlined.

3:30 – 4:00 p.m.

BREAK