

Tuesday, March 15, 2005
POSTER SESSION I: MARS GEOPHYSICS
7:00 p.m. Fitness Center

Draper D. S. Borg L. E. Agee C. B.

Crystallization of a Martian Magma Ocean and the Formation of Shergottite Source Regions: A Less Fe-rich Mars? [#1429]

Modeling a martian magma ocean having a composition slightly less Fe-rich than previously thought yields good matches to compositions of proposed shergottite parent melts.

Sohl F. Schubert G. Spohn T.

Geophysical Constraints on the Composition and Structure of the Martian Interior [#2147]

Models of the Martian interior based on the most recent value of the moment of inertia (MoI) are compared to previous models. We consider consequences a lower MoI may have for the planet's bulk chemistry and find that the Martian mantle is likely to be more Earth-like than previously thought.

Roberts J. H. Zhong S.

Degree-1 Mantle Convection and the Origin of the Martian Hemispheric Dichotomy [#1399]

We present a model in which viscosity layering in the Martian mantle leads to degree-1 convection in under 100 Myr. We propose degree-1 mantle convection as a mechanism for producing the crustal dichotomy early in Martian history and maintaining it.

Reese C. C. Solomatov V. S.

Subduction Initiation by Stagnant Lid Convection in Spherical Shell Geometry: Implications for Mars [#1974]

Scaling laws developed for spherical shell geometry indicate that initiation of subduction in the stagnant lid regime requires a very weak lithosphere as was found in two-dimensional simulations.

van Thienen P. Lognonné P.

Formation of Martian Volcanic Provinces by Lower Mantle Flushing? [#1277]

We present results of numerical mantle convection experiments in which we try to ascertain whether the flushing of the martian lower mantle (if present) could provide a mechanism for the generation of a small number of plume-like features, showing localized upwelling of hot material.

Guest A. Smrekar S. E.

Constraints on Thermal Evolution of Mars from Relaxation Models of Crustal and Topographic Dichotomy [#1880]

We constrain the early thermal evolution of Mars by testing the effect of temperature evolution in the mantle and lithosphere on the relaxation of the martian dichotomy. Thermo-magmatic stagnant lid model allows for the preservation of the martian dichotomy.

Belleguic V. Wieczorek M. Lognonné P.

Modeling of Surface and Subsurface Loads Associated with the Major Martian Volcanoes [#1909]

Localized spectral admittances of the large martian volcanoes are modeled by assuming that surface and subsurface loads are elastically supported by the lithosphere.

Milbury C. A. Raymond C. A. Jewell J. B. Smrekar S. E. Schubert G.

Joint Inversion and Forward Modeling of Gravity and Magnetic Data in the Ismenius Region of Mars [#2075]

Gravity and magnetic field anomalies may be correlated in the Ismenius area, which would permit detailed interpretation of the crustal history. We test this hypothesis by carrying out a series of joint inversions of gravity and magnetic field data.

Mitchell D. L. Lillis R. J. Lin R. P. Connerney J. E. P. Acuña M. H.

A Global Map of Mars' Crustal Magnetic Field Based on Electron Reflectometry [#2366]

We present a global map of the amplitude of Mars' crustal magnetic field at 170 km altitude based on electron reflectometry, using data from the MAG/ER experiment onboard Mars Global Surveyor.

Jurdy D. M. Stefanick M. J.

Vertical Extrapolation of Mars Magnetic Streamline Function to Surface [#1864]

We model Mars' magnetic field using the streamline function at the surface with vertical dipoles to determine the depths and magnitudes of sources.

Artemieva N. A. Hood L. L. Ivanov B. A.

Impact Demagnetization of the Martian Crust: Primaries Versus Secondaries [#1112]

Outside the transient cavity, demagnetization by secondary impacts is at least comparable with demagnetization in a direct shock wave. If magnetic minerals are in the upper crust, then shock by secondaries will be important.

Biswas S. Ravat D.

Why Meaningful Paleopoles Can't be Determined Without Special Assumptions from Mars Global Surveyor Data? [#2192]

In this paper we explore the non-uniqueness in the magnetization vectors used for determining paleopoles on Mars.

Ravat D.

Deconstructing a Few Myths in the Interpretation of Satellite-Altitude Crustal Magnetic Field: Examples from Mars Global Surveyor [#2114]

In this paper, I justify modeling of satellite-altitude magnetic field anomalies using the equivalent source method with radially-polarized and other dipole orientations and the source location interpretation using the Analytic Signal field.

Voorhies C. V.

More on Magnetic Spectra from Correlated Crustal Sources on Mars [#1490]

Theoretical magnetic spectra for laterally correlated sources in Mars's crust are described in the context of previous work. Preliminary results from applications to observational spectra, extracted from MGS MAG/ER data, are to be presented and discussed.

Urquhart M. L.

Impact of Low Thermal Conductivity Layers on the Bulk Conductivity of a Martian Crustal Column [#2337]

The impact of low and high thermal conductivity layers in the Martian crust on column averaged thermal conductivity and geothermal gradients are investigated, along with the implications for calculations of the depth to melting for ground ice.

Karatekin O. Dehant V. de Viron O. Van Hoolst T.

Atmospheric Excitation of Mars Polar Motion [#1803]

The rotation of Mars is not constant and present irregularities with time. Those are mostly associated with the atmosphere, and the condensation/sublimation of the icecaps. We have estimated the amplitudes of the two polar motion normal modes, i.e., the Chandler wobble and the Inner Core wobble.

Matsuyama I. Mitrovica J. X. Perron J. T. Manga M. Richards M. A.

Rotational Stability of Dynamic Planets with Lithospheres [#2230]

We investigate the long term rotational stability of terrestrial planets subject to surface mass and internal (convectively driven) loading. The stability theory extends work by *Willemann* [1984] and is illustrated with several case studies.