

Thursday, March 13, 2008
POSTER SESSION II: MARS TECTONICS AND DYNAMICS
6:30 p.m. Fitness Center

Neumann G. A. Lemoine F. G. Smith D. E. Zuber M. T.

Marscrust3 — A Crustal Thickness Inversion from Recent MRO Gravity Solutions [#2167]

Crustal thickness models updated by MRO gravity solutions improve on those we produced in 2004–2005. They should be appropriate for modeling impacts as small as 300 km diameter, and for processes related to the hemispheric dichotomy boundary.

Parmentier E. M. Mustard J. F. Ehlmann B. L. Roach L. H.

Deep Hydrothermal Circulation and Implications for the Early Crustal Compositional and Thermal Evolution of Mars [#1544]

Orbital remote sensing and geophysical observations indicate hydrothermal cooling of martian crust during the Noachian. We explore the combined implications of these individual constraints for the depth and vigor of hydrothermal convective cooling.

Li Q. Kiefer W. S.

Mantle Convection and Magma Production on Mars: The Effect of a Dense Layer at the Base of the Mantle [#2023]

In this on-going research, we try to explore how chemically stratified mantle may affect mantle convection and magma production on Mars. The preliminary results show strong impacts of the existence of a dense layer at the base of the mantle.

King S. D.

On Separating Mantle and Crustal Contributions to Mars Gravity and Topography [#1898]

I use spherical calculations of mantle convection to estimate the probable wavelengths of martian mantle convection. This enables an estimate of the likelihood that a wavelength of the gravity or topography data contains mantle structure.

Bills B. G. Ghent R. R. Leverington D. W. Nimmo F.

Internal Structure of Mars: Viscosity Constraints from Short Period Tides and Loads [#2016]

We present a layered, visco-elastic model of the internal structure of Mars, with viscosity values constrained to both support long wavelength topography and yield appropriate amplitude and phase lag for tidal forcing and seasonal surface loading.

Dimitrova L. L. Holt W. E. Haines A. J. Schultz R. A.

Evidence for Material Removal and/or Subsidence of the Martian Lithosphere from a Global Dataset of Surface Faults [#2209]

We use a global map of faults to evaluate geophysical models for lithospheric deformation. We find evidence for removal of material and/or lithospheric subsidence after fault formation and/or small lateral variations in crust and/or mantle densities.

Evans A. J. Andrews-Hanna J. C. Zuber M. T.

Lithospheric Flexure as a Consequence of Erosion in Arabia Terra, Mars [#1214]

Evaluating possible erosion scenarios to explain the topography, gravity anomaly trends, and crustal thickness of Arabia Terra.

Nahm A. L. Schultz R. A.

Stress Calculations for Thrust Faults in the Southern Thaumasia Region, Mars [#1111]

Surface displacements, material trajectories, Coulomb stress change, dilational normal strain, timing, and fluid pathways were determined using Coulomb for thrust faults in southern Thaumasia, Mars.

Vaz D. A. Di Achille G. Barata M. T. Alves E. I.

Manual and Automatic Lineament Mapping: Comparing Results [#1058]

A method for automatic lineament extraction using topographic data is applied on the Thaumasia plateau. A comparison is made between the results that are obtained from the automatic mapping approach and from a traditional tectonic lineament mapping.

Brown J. Li Q.

Volcano Topography and Apparent Viscosity of the Crust on Mars [#1409]

This project explores the potential viscous deformation of the crust on Mars by focusing on the major volcanos of the planet in addition to placing constraints on the average apparent crustal viscosity.

Byrne P. K. Murray J. B. Van Wyk de Vries B. Troll V. R.

Volcano Flank Terraces on Mars: Architecture [#2455]

At least nine volcanos on Mars, and three on Earth, have flank terraces. These structures are thus an important aspect of martian volcanotectonics. We favor lithospheric flexure as a leading mechanism for flank terrace formation.

Griswold J. Bulmer M. H. Beller D. McGovern P. J.

An Examination of Olympus Mons Aureoles [#2239]

New image (MOC, THEMIS, HRSC and HiRISE) and topography (MOLA) data now available allow for a re-examination of the aureoles. Spatial, geographic and topographic relations have been examined.

Cushing G. E. Titus T. N. Jaeger W. L. Keszthelyi L. McEwen A. S. Christensen P. R.

Continuing Study of Anomalous Pit Craters in the Tharsis Region of Mars: New Observations from HiRISE and THEMIS [#2447]

Seven anomalous pit craters were previously observed by THEMIS in the region around Arsia Mons, Mars. We present new observations of these pits, and of similar pits, from HiRISE and THEMIS. New constraints upon depths or minimum depths are presented.

Nunes D. C. Smrekar S. E. Seu R. Phillips R. J. Biccari D. Campbell B. A. Holt J. W. Leuschen C. Plaut J. J. Safaeinili A. Orosei R. Putzig N. E. Egan A.

Probing the Ismenius Region of the Martian Dichotomy Boundary with SHARAD [#2518]

We use radar data from SHARAD to investigate for buried faults along the dichotomy boundary at the Ismenius Region.

Fuete F. Stesky R. MacKinnon P. Hauber E. Gwinner K. Scholten F. Zegers T. E.

Structural Relations of a Sulfate-bearing Unit near Ceti Mensa, Candor Chasma, Mars [#1428]

A mapped kieserite unit within Ceti Mensa is unconformable to units that comprise Ceti Mensa. This fits a model of ILD deposition in which Ceti Mensa is a fault-bound block emplaced during ancestral basin formation, while kieserite units are late.

Hamelin N. Racher H. Fuete F. Stesky R. MacKinnon P. Hauber E. Gwinner K. Scholten F. Zegers T. E.

Structural Analysis of an Interior Layered Deposit in Northern Coprates Chasma, Mars [#1424]

Dip directions of layering of an ILD in Coprates Chasma vary on either side of the ILD. Disrupted layering and fractures suggest that a fault dissects the ILD. It is unlikely that post-deposition faulting can account for the layer attitudes.

Kostama V.-P. Ivanov M. A. Raitala J. Korteniemi J. Törmänen T.

Different Levels of Erosion During the Formation of Dao, Niger and Harmakhis Valles on Mars [#2018]

The analysis of topographic and morphologic characteristics of the head areas of Hellas valles formations gives implications for relative timing of the formation of the sources of the channels, and also for the volcanic episodes within the region.

Chapman M. G. Dumke A. Hauber E. Michael G. Neukum G. van Gasselt S.
Werner S. C. Zuschneid W.

Geologic Relations and Possible Origins of Uranus Dorsum [#2112]

Uranus Dorsum is a prominent ridge on the NW edge of Kasei that trends NE parallel to scour marks within north Kasei Valles. It is distinctly different in appearance from local wrinkle ridges that trend NW. This abstract discusses the dorsum.

Dohm J. M. Hare T. M.

How Much of an Improvement in Paleotectonic Detail is There When THEMIS and MOLA Data are Coupled with Viking Information? [#1935]

Quantitatively, how much of an improvement in paleotectonic detail is there when THEMIS and MOLA data are coupled with Viking information? This is a significant question, as there have been many Viking-based efforts to unfold the history of Mars.

Carter L. M. Campbell B. A. Watters T. R. Seu R. Phillips R. J. Biccari D. Holt J. W. Leuschen C.
Plaut J. J. Safaeinili A. Orosei R. Smrekar S. E. Putzig N. E. Egan A. F. Bernardini F.
SHARAD Team

SHARAD Sounding Radar Observations of the Medusae Fossae Formation, Mars [#1721]

The SHARAD sounding radar on MRO sees through up to 560 m of the Medusae Fossae Formation material in two separate locations. The radar data can be used to measure the physical properties of this enigmatic deposit.

El Maarry M. R. Toplis M. J. Gasnault O. Baratoux D.

Gamma-Ray Data of the Tharsis Region, Mars: A Signature of Partial Melting of the Martian Mantle? [#1289]

A combination of GRS data and thermodynamic modeling using pMELTS is used to suggest that surface compositions determined at the Tharsis rise may represent primary melts produced by direct partial melting of the Martian mantle.

Edwards S. Gilmour J. D. Ballentine C. J.

Revisiting the Role of Galactic Cosmic Ray Cosmogenic Isotopes in Martian Noble Gas Systematics [#1843]

A high GCR flux can reach the martian surface, adding to atmospheric noble gases. Also, the longevity of surface features leads to high cosmogenic muon doses. A high iodine, basalt-andesite regolith is investigated, as are muon effects.

Hood L. L. Richmond N. C.

Are Magnetic Anomalies Associated with Martian Volcanoes? An Analysis of Low-Altitude MGS Magnetometer Data [#2197]

Low-altitude MGS magnetometer data obtained near three volcanic constructs on Mars verify the existence of a magnetic anomaly associated with Apollinaris Patera. However, no detectable signatures are found associated with Tyrrhena or Hadriaca Patera.

Clevy J. R. Kattenhorn S. A.

Structural Constraints on the Eastern Equatorial Hydrogen Concentration Inferred from MOLA, Crustal Thickness, and Infrared Imagery [#2414]

Our study seeks to constrain the spatial extent of the EEH concentration by examining the spatial relationship between areas with low epithermal neutron count rates and structural variables reflected in changes in elevation and crustal thickness.