

Tuesday, March 16, 2004

POSTER SESSION I: MARS VOLCANOLOGY AND TECTONICS

7:00 p.m. Fitness Center

Vidal A. Mueller K.

*Results of Axial Surface Mapping on Solis Planum, Mars: Implications for Linked Low-Relief Arches and Wrinkle Ridges* [#2086]

Axial surface mapping and forward and inverse modeling of wrinkle ridges on Solis Planum using topographic data from MOLA are used to constrain fault geometry and the depth at which thrust faults flatten.

Artita K. S. Schultz R. A.

*3D Fault Interaction and Depth of Strike-Slip Faulting on Mars* [#1408]

We demonstrate that echelon strike-slip fault stepovers (push-up ridges) on Mars can be designated as “small” or “large” based on their map view geometries. By classifying and analyzing these geometries, depth of faulting can be estimated using the dislocation software Coulomb.

Polit A. T. Schultz R. A.

*Critical Fault Tip Gradients, Yield Strengths, and Fault Propagation on Earth and Mars* [#1351]

We demonstrate that fault tip gradient is associated with fault propagation through its connection to yield strength. This relation is applied to the determination of yield strengths on Mars, with values for examined faults ranging from 9 to 17 MPa.

Hagerty J. J. Shearer C. K. Vaniman D. T.

*Closed System Behavior of Trace Elements During Basalt Crystallization in the Makaopuhi Lava Lake, Hawaii: A Natural Laboratory for Understanding Basaltic Magmatism on Terrestrial Planets* [#1836]

Results from this study provide a unique opportunity to place trace element behavior into the context of a well-defined, natural magmatic system. These observations will help us to understand planetary basalts with limited geologic constraints.

Reese C. C. Solomatov V. S. Baumgardner J. R. Stegman D. R. Vezolainen A. V.

*Magmatic Evolution of Impact Induced Martian Mantle Plumes and the Origin of Tharis* [#1628]

Tharsis origin associated with a long-lived impact related plume requires neither globally occurring convection nor generation of plumes at the core-mantle boundary.

Roberts J. H. Zhong S.

*Plume-induced Topography and Geoid Anomalies and Their Implications for the Tharsis Rise on Mars* [#1125]

Elastic stresses in the Martian lithosphere reduce the dynamic topography created by plume buoyancy. The associated geoid becomes very small, inconsistent with that observed for Tharsis, suggesting that Tharsis is not dynamically supported.

Jaret S. J. Albin E. F.

*Plutons (Laccoliths?) on the Margins of Ancient Martian Impact Basins* [#1989]

In this investigation, we focus attention on domed structures interpreted as laccoliths. We suggest that upon removal of non-indurated basin ejecta, plutonic features are exposed at the surface.

Goudy C. L. Schultz R. A.

*Dike Intrusions Along Pre-existing Graben Border Faults South of Arsia Mons* [#1126]

The giant radiating dike swarm hypothesis is not sufficient to explain graben near Tharsis based on MOLA topographic profiles. The pattern is best explained by a model that incorporates a combined graben formational mechanism of dikes and faults.

de Pablo M. A. Márquez A.

*A Possible Dike System on Atlantis Basin Regin, Sirenum Terrae, Mars* [#1138]

Recent THEMIS images shown some linear structures into Atlantis Basin, southern hemisphere of Mars. In this work these structures and their relationship with groundwater are described.

Scott E. D. Wilson L.

*How Lateral Density Gradients Affect the Distribution of Multiple Magma Chambers Within Martian Shield Volcanoes* [#1536]

We propose that the reason why certain martian volcanoes produce multiple summit calderas is that the locations of successive underlying magma chambers migrate under the influence of lateral density gradients that form within the edifice.

Ellis B. Wilson L. Pinkerton H.

*Estimating the Rheology of Basaltic Lava Flows* [#1550]

We use detailed information on the advance of Hawaiian lava flows to deduce down-flow trends of viscosity, yield strength and cooling.

Glaze L. S. Baloga S. M. Mouginis-Mark P. Crisp J.

*A Model for Variable Levee Formation Rates in an Active Lava Flow* [#1036]

We present a levee formation model that treats the rate of levee growth as a function of distance. Although lengths, thicknesses and slopes at 2 flows differ by an order of magnitude, and rheologic changes during emplacement were very different, the nature of the levee formation process was similar.

Chadwick D. J. Hughes S. S. Sakimoto S. E. H.

*Deflections in Lava Flow Directions Relative to Topography in the Tharsis Region: Indicators of Post-Flow Tectonic Motion* [#2019]

Directions of lava flows in the Tharsis region have been compared with MOLA-derived topographic slopes to identify flows that do not appear to be aligned with the downhill slope direction. This is an indication of tectonic deformation after the emplacement of the flow.

Hudson R. K. Anderson S. W. McColley S. Fink J. H.

*Fractal Variation with Changing Line Length: A Potential Problem for Planetary Lava Flow Identification* [#1601]

We examined the variability of fractal dimension for a number of natural and simulated lava flows and found that unambiguous identification of lava flow morphology is possible if higher residuals values are obtained.

Haack H. Dall J. Rossi M.

*Burfellshraun — A Terrestrial Analogue to Recent Volcanism on Mars* [#1468]

Up to 2000 km long, young lava flows from Elysium Planitia to Amazonis Planitia on Mars often include km-sized rafting plates. We have studied the unique Burfellshraun lava field in Iceland that share many characteristics of the Martian flows.

Rampey M. L. Milam K. A. McSween H. Y. Jr. Moersch J. E. Christensen P. R.

*Lava Domes of the Arcadia Region of Mars* [#2107]

This study examines the morphologic, morphometric, and spectral characteristics of lava domes in the Arcadia Planitia region of Mars with respect to possible evidence of silicic volcanism

Weren S. L. Sakimoto S. E. H. Hughes S. S. Gregg T. K. P.

*Comparison of Plains Volcanism in the Tempe Terra Region of Mars to the Eastern Snake River Plains, Idaho with Implications for Geochemical Constraints* [#2090]

This study provides a topographic parameter analysis of the volcanic edifices of the Eastern Snake River Plains, Idaho and Tempe Terra Mars. The topographic parameters in these areas partially overlap, suggesting similar causes of diversity.

Christiansen E. H. Hurst M.

*Vent Geology of Low-Shield Volcanoes from the Central Snake River Plain, Idaho: Lessons for Mars and the Moon* [#2143]

The near-vent morphology of low-shield volcanoes of the Snake River Plain is shaped by stagnation and degassing of a magma column in the vent.

Brady S. M. Hughes S. S. Sakimoto S. E. H. Gregg T. K. P.

*Field and Geochemical Study of Table Legs Butte and Quaking Aspen Butte, Eastern Snake River Plain, Idaho: An Analog to the Morphology of Small Shield Volcanoes on Mars* [#2145]

Terrestrial examples of Mars shield morphology found on the eastern Snake River Plain allows an analog to Martian volcanism based on topographic manifestations of volcanic processes.

Farrand W. H. Gaddis L. R. Blundell S.

*Variability in Morphology and Thermophysical Properties of Pitted Cones in Acidalia Planitia and Cydonia Mensae* [#1928]

Pitted cones in Acidalia and Cydonia were examined using THEMIS, MOC, and other data sources. Two classes with unique morphologic and thermophysical properties were identified.

Lucchitta B. K.

*A Volcano Composed of Light-colored Layered Deposits on the Floor of Valles Marineris* [#1881]

A hill composed of light-colored interior layered deposits in central Candor Chasma is flanked by outwardly dipping beds. The configuration is most compatible with a volcanic cone. If so, other interior layered deposits may be volcanic as well.

Shockey K. M. Glaze L. S. Baloga S. M.

*Analysis of Alba Patera Flows: A Comparison of Similarities and Differences* [#1154]

Four Martian lava flows originating from Alba Patera are analyzed in order to compare and contrast characteristics such as relative viscosity increase, degree of degassing, emplacement times, and levee building.

Peitersen M. N. Zimbelman J. R. Irwin R. Christensen P. R. Rice J. W. Bare C. Neumann G. A.

*Geomorphologic Studies of a Very Long Lava Flow in Tharsis, Mars* [#1421]

CEPS has undertaken an extended study of long lava flows on the terrestrial planets. As part of this ongoing investigation, we have concentrated on the geomorphology of a single large flow in Tharsis, using MOLA and THEMIS data.

Byrnes J. M. Crown D. A.

*Radar Backscatter Characteristics of Basaltic Flow Fields: Results for Mauna Ulu, Kilauea Volcano, Hawai'i* [#1436]

This study examines the complex unit-scale topography produced by primary lava emplacement and secondary modification, as well as the utility of radar data for distinguishing flow regimes and post-emplacement changes within basaltic flow fields.

Bleacher J. E. Greeley R.

*Preliminary Lava Tube-fed Flow Abundance Mapping on Olympus Mons* [#1378]

We estimate the abundance of tube-fed flows on Olympus Mons by mapping their presence based on collapse pit chains, elongate tumuli, and raised ridges. Preliminary results indicate that late stage effusive activity was typified by channel forming eruptions, which embay most tube-fed flows.