

Thursday, March 18, 2004

POSTER SESSION II: MARS: REMOTE SENSING AND TERRESTRIAL ANALOGS
7:00 p.m. Fitness Center

Cord A. Pinet P. C. Chevrel S. D. Daydou Y. Shkuratov Y. G. Stankevich D. G. Petrov D. V.
Physical Meaning of the Hapke Parameter for Macroscopic Roughness (): Experimental Determination for Planetary Regolith Surface Analogs and Numerical Approach [#1708]

We focus on the physical meaning of the Hapke shadowing function parameter () and show with new laboratory observations that it is an integral of the mesoscale and microscale roughness properties in the submillimetric-centimetric range.

Sunshine J. M. Bishop J. Dyar D. Hiroi T. Klima R. Pieters C. M.
Near-Infrared Spectra of Martian Pyroxene Separates: First Results from Mars Spectroscopy Consortium [#1636]
 Analyses of VNIR spectra of pyroxenes separated from Mars meteorites are presented. Variations in site occupancy to explain VNIR features and their implications for bending and stretching features at mid- and far-infrared wavelengths are discussed.

Hoffman E. J. Black R. L. Bickraj K. L. Cloutis E. A.
Anomalous Spectra of High-Ca Pyroxenes: Correlation Between Ir and Mössbauer Patterns [#1128]
 For both near-infrared reflectance (NIR) and Mössbauer spectroscopy (MS) of high-Ca pyroxenes interpretation has been complicated by anomalous results. In 17 terrestrial samples anomalies in MS are correlated with those of NIR.

Brumby S. P.
THEMIS-IR Emissivity Spectrum of a Large "Dark Streak" near Olympus Mons [#2095]
 "Dark streaks" are unusual transient surface features found on Mars. We have obtained an infrared emissivity spectrum of a large dark streak on the north western edge of Olympus Mons, using imagery from the THEMIS instrument on the Mars Odyssey 2001 spacecraft.

Keszthelyi L. Burr D. M. McEwen A. S.
Geomorphologic/Thermophysical Mapping of the Athabasca Region, Mars, Using THEMIS Infrared Imaging [#1657]
 We have completed geomorphologic mapping on THEMIS IR data, showing a complex mix of aqueous, volcanic, tectonic, impact, and eolian processes in the Athabasca region of Mars.

Putzig N. E. Mellon M. T. Jakosky B. M. Pelkey S. M. Martinez-Alonso S. Hynek B. M. Murphy N. W.
Mars Thermal Inertia from THEMIS Data [#1863]
 We present a new technique for deriving THEMIS thermal inertia using a modified version of standard MGS-TES software. High THEMIS uncertainties and low resolution of ancillary data require calibration of THEMIS results against those from TES.

Stockstill K. R. Moersch J. E. McSween H. Y. Jr. Christensen P. R.
Multispectral Analysis Methods for Mapping Aqueous Mineral Deposits in Proposed Paleolake Basins on Mars Using THEMIS Data [#1577]
 We use THEMIS data to make spectral unit maps in search of potential aqueous mineral deposits (of smaller scale than the TES footprint) within proposed paleolake basins. A TES spectrum of the same area will be examined for subtle spectral features.

Kirk R. L. Soderblom L. A. Cushing G. Titus T.
Joint Analysis of Mars Odyssey THEMIS Visible and Infrared Images: A "Magic Airbrush" for Qualitative and Quantitative Morphology [#2056]
 We present a novel approach to processing THEMIS visible and IR images in order to separate thermal, albedo, and slope effects. The isolated slope modulation reveals subtle topographic features that can be quantitatively modeled by photoclinometry.

Staid M. I. Johnson J. R. Gaddis L. R.

Analysis of Mars Thermal Emission Spectrometer Data Using Large Mineral Reference Libraries [#1778]

A method is presented for the analysis of Mars TES and Mini-TES data that allows mineralogical analysis relative to spectral reference libraries of unlimited size. The algorithm has been applied to the Mars type I and II surface spectra.

Rodricks N. Kirkland L. E.

Negative Abundance — A Problem in Compositional Modeling of Hyperspectral Images [#2053]

Linear mixture modeling is a technique used to identify and estimate the abundance of minerals in hyperspectral images, terrestrially and on Mars. A primary drawback of this established method is that it can return a negative abundance of a material.

Kirkland L. E. Herr K. C. Allen B. M. Adams P. M. McAfee J. M. Keim E. R.

Mars-LAB: First Remote Sensing Data of Mineralogy Exposed at Small Mars-Analog Craters, Nevada Test Site [#1846]

MarsLab is a thermal infrared spectrometer study of mineralogy exposed by small Mars-analog craters (~25–400 m diameter). It uses the only field instruments that are high fidelity analogs to current Mars thermal-IR orbited and rover spectrometers.

Greenhagen B. T. Kirkland L. E. Grabowski T. Rainey E. S. G.

A Tool for the 2003 Rover Mini-TES: Downwelling Radiance Compensation Using Integrated Line-Sight Sky Measurements [#1693]

Environmental downwelling radiance can alter spectra measured of rocks by the Mini-TES. We will show field spectrometer images measured like the Mini-TES, and a new technique that improves the signatures used for compositional identification.

Probst L. W. Kirkland L. E. Burt D. M.

Learning About Mars Geology Using Thermal Infrared Spectral Imaging: Orbiter and Rover Perspectives [#1955]

This work studies the Amboy Crater site in southern California with Thermal Infrared (TIR) spectral imaging to learn how to better interpret the geology of a site from TIR data. We will then apply this type of study to understanding TIR data from Mars.

Bishop J. L. Schiffman P. Southard R. J. Drief A. Verosub K. L. Smith D. J.

Classifying Terrestrial Volcanic Alteration Processes and Defining Alteration Processes they Represent on Mars [#1780]

Characterizing alteration of the rocks on Mars benefits from comparison with terrestrial volcanic alteration, which we define as palagonitic, pedogenic and solfataric processes. Multiple samples were characterized using spectroscopy, SEM, TEM, XRD.

Bishop J. L. Schiffman P. Drief A. Southard R. J.

Cemented Volcanic Soils, Martian Spectra and Implications for the Martian Climate [#1796]

Cemented volcanic crusts are studied to learn about their composition, formation processes, and implications for climate interactions with the surface on Mars. Such carbonate, sulfate and opal crusts may be present in cemented soil units on Mars.

Morris R. V. Graff T. G. Ming D. W. Bell J. F. III Le L. Mertzman S. A. Christensen P. R.

Palagonitic Mars: A Basalt Centric View of Surface Composition and Aqueous Alteration [#1606]

VNIR and TES spectra on palagonitic rinds show that Mars can be entirely basaltic in composition and be weathered everywhere without the presence of phyllosilicates.

Gendrin A. Poulet F. Charvin N. Langevin Y. Mustard J. F.

Combining a Non Linear Unmixing Model and the Tetracorder Algorithm: Application to the ISM Dataset [#1207]

We calculate a library of mineral mixtures through the application of a non linear unmixing algorithm. We apply the Tetracorder algorithm, using this calculated spectral library, on the ISM dataset.

Cloutis E. A.

Spectral Reflectance Properties of Some Basaltic Weathering Products [#1265]

Reflectance spectra of basaltic alteration products exhibit a range of spectral properties. In some cases high iron abundances do not lead to strong iron-associated absorption bands and in other cases water- and OH-associated absorption bands are weak or absent.

Finnegan D. C. Ghent R. R. Byrnes J. M. Bourke M.

Morphometric LIDAR Analysis of Amboy Crater, California: Application to MOLA Analysis of Analog Features on Mars [#1736]

We report on preliminary morphometric analysis of LIDAR data for volcanic, fluvial and aeolian features to identify optimal LIDAR parameters for geological analysis of terrain analogous to Mars.

Doggett T. C. Greeley R. Baker V. Chien S. Davies A. G. Dohm J. M. Ferré T. P. A. Hinnell A. Rucker D. Williams K.

Airborne Radar Study of Soil Moisture at a Mars Analog Site: Tohachi Wash/Little Colorado River [#1326]

We studied the response of multi-band quad-polarized synthetic aperture radar to soil moisture at a Mars analog site, finding significant correlation for surface moisture at L-VV on a smooth surface and no correlation for deeper depth or rougher surface.

Marchant D. R. Head J. W. III

Antarctic Dry Valleys: Modification of Rocks and Soils and Implications for Mars [#2051]

We present a range of analogs from the Dry Valleys of Antarctica that will shed light on the origin of small scale landforms on Mars.

Clarke J. D. A. Thomas M. Norman M.

The Arkaroola Mars Analogue Region, South Australia [#1029]

The Arkaroola region of central South Australia provides a useful locale for Mars analog research into geology, astrobiology, and several other disciplines.