

Tuesday, March 18, 2003
POSTER SESSION I
7:00 p.m. Fitness Center

Mars Surface Composition from Infrared Spectroscopy

Ciccolella S. M. Moersch J. E.

Spectroscopic Observations of Subresolved Targets: Applications to the MER Mini-TES and RAT Experiments [#1836]

Methods to deconvolve the spectrum of a target that incompletely fills a spectrometer's field of view are explored. During MER, areas of Mars rocks will be abraded to expose a fresh surface. Spectra of this target will be subresolved by Mini-TES.

Bishop J. L. Minitti M. E. Lane M. D. Weitz C. M.

The Influence of Glassy Coatings on Volcanic Rocks from Mauna Iki, Hawaii and Applications to Rocks on Mars [#1516]

We have characterized yellow and orange glassy coatings on volcanic rocks for a study of rock coatings on Mars. Interesting spectral properties have been observed in the VIS/NIR and mid-IR regions; these are compared with MPF-IMP and TES data of Mars.

Minitti M. E. Weitz C. M. Lane M. D. Bishop J. L.

Compositions and Spectra of Several Hawaiian Rock Coatings [#1937]

We conducted extensive chemical and spectral analyses of distinct coatings on five different Hawaiian basalts. The effects of coating chemistry, coating thickness and the substrate basalt on VISNIR and mid-IR spectral properties are addressed.

Gaddis L. R. Staid M. I. Johnson J. R. Titus T. N.

Mineral Mapping in Valles Marineris, Mars: A New Approach to Spectral Demixing of TES Data [#1956]

We applied multiple endmember demixing to TES data to determine the composition of geologic units in Valles Marineris. The goal is to map the compositions of VM dark deposits and layered units of the walls and interior deposits.

Hamilton V. E. Morris R. V.

Thermal Emission Spectra of Altered Tephra and Constraints on the Composition of Martian Dust [#1936]

We have acquired IR spectra of unaltered and altered tephra for use in the interpretation of MGS TES data. We examine correlations between H₂O band strength and composition, and compare tephra spectra to a martian surface dust spectrum from TES.

Burt D. Adams P. M. Kirkland L. E. Herr K. C.

First Airborne Thermal Infrared Hyperspectral Imaging of a Dry Lake: Site Geology and TES/THEMIS Interpretations of Mars [#1860]

Surface texture affects spectral signatures, but TES/THEMIS lab targets have very restricted textures. We illustrate the looming gap between the lab and field spectral worlds, show real-world textural variety, and impacts on current interpretations.

Kirkland L. E. Keim E. R. Herr K. C. Adams P. M. Burt D. McAfee J. M.

First Airborne Thermal Infrared Hyperspectral Imaging of a Dry Lake: Real-World Data and TES/THEMIS Mars Interpretations [#1887]

Will the foundation lab data used for TES/THEMIS interpretations correctly identify the mineral deposits at Bristol Dry Lake? A hallmark of this work is the collaboration of specialists in field geology and field spectroscopy.

McSween H. Y. Jr. Hamilton V. E. Hapke B. W.

Mineralogy of Martian Atmospheric Dust Inferred from Spectral Deconvolution of MGS TES and Mariner 9 IRIS Data [#1233]

Deconvolution of TES spectra from martian dust storms suggests the presence of framework silicates (plagioclase and zeolite), possibly with gypsum and pyroxenes. Fits to IRIS spectra are poor and suggest problems in applying optical constants.

Edmonds J. L. Robinson M. S.

New Mariner 6 and 7 Mosaics of Mars: Clues About Time Variable Surface Features [#1436]

Reprocessed data from Mariner 6 and 7 (1969) provide a valuable timestep with which to examine large scale surface processes on Mars. Mechanisms responsible for variations in albedo features are discussed in the context of this and other data.

Farrand W. H.

Discrimination of Hydrovolcanic Tephra from Volcanic and Non-Volcanic Backgrounds in Hyperspectral Data of Pavant Butte and Tabernacle Hill, Utah: Relevance for Mars [#1457]

Airborne hyperspectral image data were used to examine the Pavant Butte tuff cone and Tabernacle Hill tuff ring in the Black Rock Desert of Utah. Palagonitized and poorly palagonitized tephra were successfully discriminated from volcanic and non-volcanic backgrounds.

Johnson J. R. Staid M. I. Titus T. N. Gaddis L.

Thermal Emission Spectrometer Mosaics of Impact Craters: Progress on Shocked Plagioclase Detections [#2041]

We are using a combination of mineral laboratory spectra and spectra of experimentally shocked feldspars to deconvolve the TES spectra. We find that locations of shocked feldspar detections are not restricted to ejecta near large craters.

Stockstill K. R. Ruff S. W. Moersch J. E. Baldrige A. Farmer J.

TES Hyperspectral Mapping of Proposed Paleolake Basins in the Aeolis Quadrangle of Mars: A Search for Aqueous Minerals [#1793]

This study uses TES hyperspectral data to search for spectral features of aqueous minerals within previously proposed paleolake basins within the Aeolis Quadrangle of Mars. Thus far, no aqueous minerals have been detected in these basins.

Graff T. G. Morris R. V. Christensen P. R.

Lunar Mare Basalts as Analogues for Martian Volcanic Compositions: Evidence from Visible, Near-IR, and Thermal Emission Spectroscopy [#1632]

The lunar mare basalts potentially provide a unique sample suite for understanding the nature of basalts on the martian surface. With visible, near-IR, and thermal emission spectroscopy we have examined 15 lunar samples as Mars analogues.

Antonenko I. Cloutis E. A.

Analysis of Mathematical Models for Reflectance Absorption Spectra [#2095]

We analysed how well different mathematical functions model reflectance absorption spectra. A modified gaussian model often worked best. Some correlation between model and peak width was noted.

Gendrin A. Erard S.

Phobos's Mineralogy Reinvestigated. Application of the Wavelet Transform to the Analysis of ISM/Phobos2 Infrared Spectra [#1273]

The reinvestigation of ISM infrared spectra of Phobos leads to the conclusion that the mineralogical composition of the satellite comprises olivine in the whole observed area, while orthopyroxene is detected only in some localised regions.

Poulet F. Erard S. Gendrin A.

Modelling of Mineral Mixture Reflectance Spectra [#1590]

The purpose of the paper is to use the Shkuratov scattering theory to determine the type of mixture, the relative proportions, and the grain sizes of components (minerals) of laboratory common geologic mineral mixtures given reflectance spectra of the endmembers only.