

Tuesday, March 24, 2009

**POSTER SESSION I: UP CLOSE AND PERSONAL: IN SITU ANALYSIS WITH
LASER-INDUCED BREAKDOWN SPECTROSCOPY AND MASS SPECTROMETRY**

6:30 p.m. Town Center Exhibit Area

Maurice S. Wiens R. Parès L. Bender S. le Roch N. Dalmau J. Berthé M. Langevin Y.
Herkenhoff K. Bridges N. Saccoccio M. ChemCam Team

[Characterization of the ChemCam \(MSL\) Imaging Capability](#) [#1864]

The ChemCam instrument comprises a Remote Micro-Imager (RMI) to place the LIBS analyses in their geomorphologic context. We present RMI flight unit test results, including the characteristics and performances of this imaging capability on MSL.

Forni O. Clegg S. Wiens R. C. Maurice S. Gasnault O.

[Multivariate Analysis of ChemCam First Calibration Samples](#) [#1523]

We present a multivariate analysis of the first calibration of the ChemCam LIBS instrument on board MSL. We use two methods PCA and ICA on the same data set and compare them.

Mungas G. S. Dreyer C. B. Bauer A. J.

[Elemental Abundance Measurement Using Micro-LIBS for Space Exploration](#) [#2264]

LIBS elemental measurements suffer from inaccuracies we believe are fundamentally tied to uncertainty in the LIBS plasma thermal history. We propose a method to decode plasma temperature history with elemental abundance from observed emission lines.

Perkins J. J. Sharma S. K. Clegg S. M. Misra A. K. Wiens R. C. Barefield J. E.

[Remote Laser-induced Breakdown Spectroscopy \(LIBS\) Analysis of Hydrated Sulfates](#) [#1397]

We report here the use of remote LIBS for determining degree of hydration in sulfate minerals. With LIBS onboard MSL it will be possible to glean information about the degree of hydration along with major and minor elements on the surface of Mars.

Fabre C. Maurice S. Sautter V. Wiens R. Dubessy J. Boiron M. C. CHEM-CAM Team

[Onboard Calibration Silicate Targets for the Chemcam LIBS Instrument \(MSL Rover\)](#) [#1502]

The MSL rover lander will carry rover-mounted calibration targets. The chemical compositions of the basaltic targets were checked using electron microprobe. The homogeneity is very good at the micrometric scale, even for the trace elements.

Rauschenbach I. Jessberger E. K. Hübers H. W. Pavlov S. G.

[Miniaturized Laser-induced Breakdown Spectroscopy for Planetary Surface Analysis](#) [#1563]

LIBS is currently under development for future lander missions to Mars and other planets and moons. Here we report on our study of different parameters that are of importance for a lightweight LIBS instrument specifically in the martian environment.

Cousin A. Maurice S. Parot Y. Michel Y. Le Roch N. Dalmau J. Parès L. Perez R. Cros A.

Wiens R. ChemCam Team

[ChemCam \(MSL\) Autofocus Capabilities](#) [#1684]

ChemCam is a remote instrument to investigate martian geochemistry, using the LIBS technique, a board of the MSL rover. The aim of this work is to present the initial calibration of ChemCam, and to investigate the effect of the rocks' parameters on the autofocus function.

Laan E. C. van Westrenen W. Wiolders A. Heiligers J. MoonShot Partners

[MoonShot: A Combined Raman/LIBS Instrument for Lunar Exploration](#) [#1836]

A consortium led by the Dutch Organisation for Applied Scientific Research with partners from Dutch industry and academia aims to provide a combined Raman/LIBS instrument as scientific payload for lunar and planetary exploration missions.

Vaniman D. T. Clegg S. Lanza N. Newsom H. Wiens R. C. ChemCam Team

[*Fabrication of Sulfate-bearing Ceramic Calibration Targets for the ChemCam Laser Spectroscopy Instrument, Mars Science Lander* \[#2296\]](#)

A need for sulfur-bearing calibration targets for LIBS analysis by ChemCam on the Mars Science Lander required development of low-fire ceramics. A range of sulfur contents can be obtained that mimic soil or rock at the potential landing sites.

Tucker J. M. Dyar M. D. Clegg S. M. Schaefer M. W. Wiens R. C. Barefield J. E. II

[*LIBS Analysis of Minor Elements in Geologic Samples* \[#2024\]](#)

The first investigation of minor element detection by LIBS for ChemCam calibration shows promise for identification and quantification of minor elements by statistical techniques.

Anderson F. S. Nowicki K.

[*In-Situ LDRIMS Geochronometry for the Moon and Mars* \[#2290\]](#)

Latest progress on the development of a Laser Desorption Resonance Ionization Mass Spectrometer (LDRIMS) instrument for *in situ* rubidium-strontium (Rb-Sr) geochronology.

Strashnov I. Blagburn D. J. Gilmour J. D.

[*Resonant Photoionization Mass Spectrometer for Determination of Isotopic Compositions of Krypton in Extraterrestrial Samples* \[#1645\]](#)

An ultra sensitive MS for determination of Kr has been developed. A four wave mixing in Xe is used for generation of vuv light necessary for the first resonant step of three color ionization scheme. Kr isotopic ratios of air samples and Stannern meteorite determined.

Mahaffy P. R. Hodges R. R. Benna M. Harpold D. N. Kasprzak W. K. Kellogg J. W. King T. T.

[*Neutral Mass Spectrometer Under Development for the Lunar Atmosphere and Dust Environment Explorer \(LADEE\) Mission* \[#1217\]](#)

Description of the Neutral Mass Spectrometer that is one of three instruments under development for the Lunar Atmosphere and Dust Environment Explorer (LADEE) Mission.

Nagashima K. Huss G. R. Kosaka K. Kunihiro T. Keil K. Krot A. N. Taylor G. J. Yurimoto H.

[*Development of Isotope Imaging System with Two-Dimensional Ion Detector SCAPS for ims-1280 Secondary Ion Mass Spectrometer* \[#2066\]](#)

We are developing a new imaging detector system using the SCAPS in combination with the University of Hawaii Cameca ims-1280 SIMS instrument. We present results of initial tests of the system as well as details of the system.

Davis A. M. Stephan T. Veryovkin I. V. Pellin M. J. Savina M. R.

[*The Ion Nanoprobe: A New Instrument for Studying the Isotopic and Elemental Composition of the Solar System and Beyond at the Few-Nanometer Scale* \[#2472\]](#)

The ion nanoprobe is a new instrument designed for isotopic, chemical, and possibly molecular analysis at lateral resolutions of a few nanometers. This instrument, now under construction, will be applied to a broad range of problems in cosmochemistry.

Hilchenbach M. Lang T. Hornung K. Thirkell L. Briois C.

[*UV-Laser Desorption Ion Source Applied to a Secondary Ion Mass Spectrometer* \[#1162\]](#)

We were focusing on using a new UV laser ion desorption source combined with a SIMS laboratory time-of-flight mass spectrometer, the latter being very similar to the COSIMA flight instrument onboard Rosetta.

Greer F. Fisher A. Corso T. MacAskill J. Willis P. A.

[*Nanospray Ionization for Coupling Capillary Electrophoresis with Mass Spectrometry for In Situ Titan Exploration* \[#2200\]](#)

This paper will present the status of our effort to develop a Lab-on-a-Chip instrument coupling microCE to MS via nanospray ionization enabling *in situ* detection and analysis of target compounds on Mars or the moons of the outer solar system.