Cordilleran Section - 113th Annual Meeting - 2017

Paper No. 12-7
Presentation Time: 8:30 AM-5:00 PM

SPECTRAL VARIABILITY ALONG CURIOSITY'S TRAVERSE THROUGH THE MURRAY FORMATION FROM MARS SCIENCE LABORATORY/MASTCAM MULTISPECTRAL OBSERVATIONS

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The Mastcam cameras on the Mars Science Laboratory Curiosity rover frequently acquire multiple-filter imaging observations along the Gale crater traverse that document the visible/near-infrared reflectance properties of the surface from 445-1012 nm. The most recent portion of the rover's traverse through the Murray Formation has taken it into a region of elevated hematite abundance observed weakly from orbit [1], and now in situ by Mastcam and ChemCam passive [2,3] observations. In Mastcam filters, the presence of crystalline hematite is detected from an absorption near the camera's 527 nm filter and a near-infrared band near the 867 nm filter, with a positive reflectance slope from 867 nm to the longest-wavelength filters at 1012 nm. From the ground, Mastcam has observed these hematite spectral features to be almost always present in recently-traversed Murray bedrock (since approximately sol 1160); however, significant variation exists from site to site and over small spatial scales. Spectral differences in the strength of the 867 to 1012 nm spectral slope, visible wavelength color (*e.g.*, red/blue ratio), and differences in overall reflectance and peak reflectance wavelength are typical of the diversity in spectral properties that the cameras have observed. These variations suggest differences in mineral grain sizes and/or abundances of iron-bearing mineral phases. Mastcam multispectral observations are helping to document and define additional *in situ* measurements needed to understand the complex aqueous history within Gale crater.

[1] Fraeman *et al.* (2016) AGU Fall Meeting abstract P23B-2173 [2] Johnson *et al.* (2016) LPSC abstract #1155. [3] Johnson *et al.* (2017) LPSC abstract #1301.

Session No. 12--Booth# 44

T16. New Developments in the Geology and Geochemistry of Mars (Posters)
Tuesday, 23 May 2017: 8:30 AM-5:00 PM

Room 323A/B/C (Hawai'i Convention Center)

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