REINVESTIGATING GALE CRATER WITH NEW NIR SPECTRAL PARAMETERS. S. Mittal¹, J. Hanley², B. Horgan³, R. Carmack⁴. ¹Northeastern University, Boston, MA; ²Lowell Observatory, Flagstaff, AZ (jhanley@lowell.edu); ³Purdue University, West Lafayette, IN; ⁴Northern Arizona University, Flagstaff, AZ.

Introduction: The mineralogy of the Martian surface has been studied in an attempt to better understand the history of the planet, as well as give evidence for the habitability of the planet. Hydrated sulfates that have been identified share similar spectral features to many other hydrated salts [1]. New spectral parameters can be useful in distinguishing chlorine salts from other hydrated minerals [2] and were used in this analysis.

The focus of this analysis was on the Curiosity landing site Gale Crater (Figure 1). Curiosity has observed perchlorate salts at Gale [3]. Analysis of CRISM images using new parameters, in combination with previous ones, could lead to the identification of hydrated chlorine salts on the Martian surface.

Methods: MTRDR files were downloaded for the seven sites analyzed. The 2014 summary products [4] were added to the available bands list from the CAT menu so they could be utilized in the analysis. Parameters for the 2.13 µm and 2.22 µm spectral features [2], indicative of hydrated perchlorates and oxychlorine salts, respectively, were added as well. Spectra were then extracted and compared to known spectra to identify minerals present.

Results: A091 and 37DF showed strong absorptions at 1.9 µm (Figures 2, 3), and 37DF showed an additional broad absorption at 2.13 µm (Figure 4). The parameter BD2130 used to look for the 2.13 µm absorption was intended to identify hydrated perchlorates. High-calcium pyroxene exhibits features that are also highlighted by the BD2130 parameter, having absorption features near 1.03 µm and 2.3 µm [4]. Previous CRISM analysis has shown that pyroxenes are present in Gale Crater [5]. Figure 5 shows the spectra from 37DF compared to HCP.
The 1.9 \( \mu m \) absorption that was observed in 37DF and A091 is indicative of hydrated salts. After comparing the spectra from these sites to known lab spectra they were seen to most closely resembled MgSO\(_4\)•7H\(_2\)O and hydrated Ca(ClO)\(_2\)•H\(_2\)O (Figure 6).

**Discussion:** The BD2130 parameter used to analyze the CRISM images was highlighted strongly in 37DF. It was determined that the mineral being detected was not a perchlorate, but likely HCP. Given these results, it was determined that the BD2130 parameter serves as a strong indicator for the presence of high-calcium pyroxene.

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