

Abstract Submitted  
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**Characterization of an Extremophile Based Chlorophyll Raman  
Threshold Signal in Martian Regolith Simulant as a Potential Astrobio-  
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ANDREW, University of Kentucky , MELINDA THOMAS , Western Kentucky University, QUENTIN LINEBERY, Applied Physics Institute, ALICIA PESTERFIELD, PHILLIP WOMBLE, Western Kentucky University — As NASA prepares for missions to Mars there is a need to determine the viability of the Martian regolith at proposed landing sites. Data from the Mars Curiosity Rover mission has produced direct sampling of the Martian surface allowing for the production of a bulk regolith simulant: JSC Mars-1. This material can be combined with other trace elements in a laboratory setting to develop threshold tests for potential interesting and novel measurements, including molecules that can be preserved on Mars in a shielded environment underground. In particular the Martian climate represents a potentially survivable environment for several Archaea based extremophiles that have been identified on Earth. A number of these species include cyanobacteria with chloroplasts that are found in eukaryotes and prokaryotes that carry versions of chlorophyll that could be left as a trace material. Following Böttger we perform coupled Raman and NFOM measurements on samples with various concentrations of chlorophyll embedded in a five MPa compressed casing of JSC Mars-1 Martian regolith simulant to determine guidelines for the minimum threshold for detection. We compare lines identified in the spectra of the chlorophyll samples and find a threshold sigmoid near 181 ppb level of concentration.

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