# Applying CRISM spectrum parameters

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Some of the figures and images created, and their details.

# Contents

**Notes and background information**   The 'readParams.m' is the main program to calculate the band depth parameters, it also needs the 'BDP.m' function to be loaded as well. I set a threshold of 0.3 for a universal max of the band depth parameters, I read from the website that up to around 0.1 can be expected, so even my 0.3 is pretty high. This value can be changed for each band depth by scrolling down to its associated number and changing the 'imageThresh' variable within MATLAB. This is just the SWIR images of rock 1 side 1 that is on dropbox, I will continue to work and update as I go.

# FAL

**Background details:** From 'false color.' An enhanced infrared false color representation of the scene. The wavelengths chosen highlight differences between key mineral groups. Red/orange colors are usually characteristic of olivine-rich material, blue/green colors often indicate clay, green colors may indicate carbonate, and gray/brown colors often indicate basaltic material.
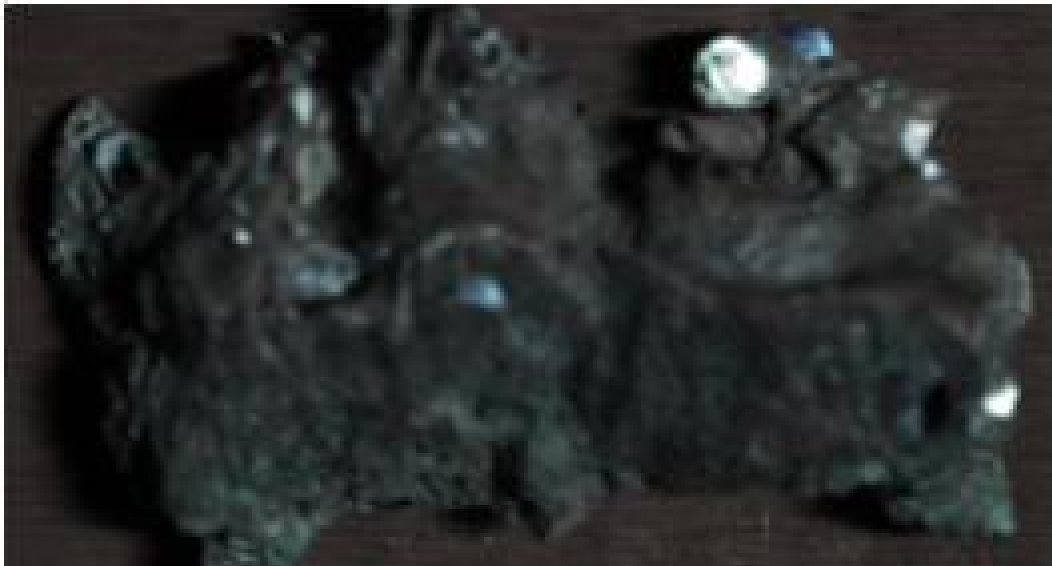
# MAF

**Background details:**   From 'mafic mineralogy' Shows information related to mafic mineralogy.  Olivine and Fe-phyllosilicate share a 1.0 to 1.7 mu m bowl-shaped absorption and will appear red in the MAF browse product. Low- and high-Ca pyroxene display additional about 2.0 mu m absorptions and appear green/cyan and blue/ magenta, respectively.
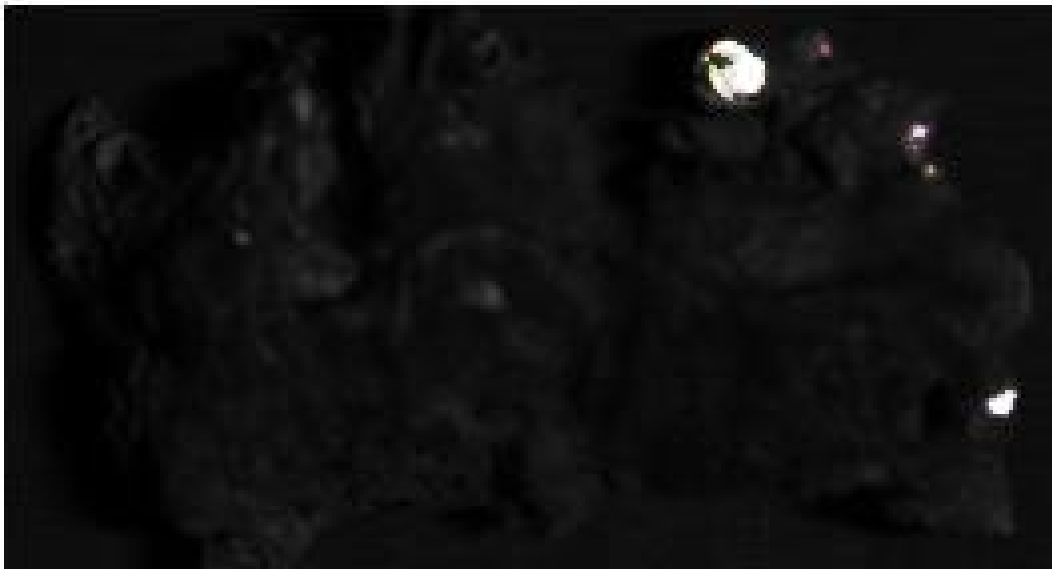
# HYD

**Background details:** From 'hydrated mineralogy' Shows information related to bound water in minerals. Polyhydrated sulfates have strong 1.9 mu m and 2.4 mu m absorption bands, and thus appear magenta in the HYD browse product. Monohydrated sulfates have a strong 2.1 mu m absorption and a weak 2.4 mu m absorption band, and thus appear yellow/green in the HYD browse product. Blue colors are indicative of other hydrated minerals (such as clays, hydrated silica, carbonate, or zeolite).
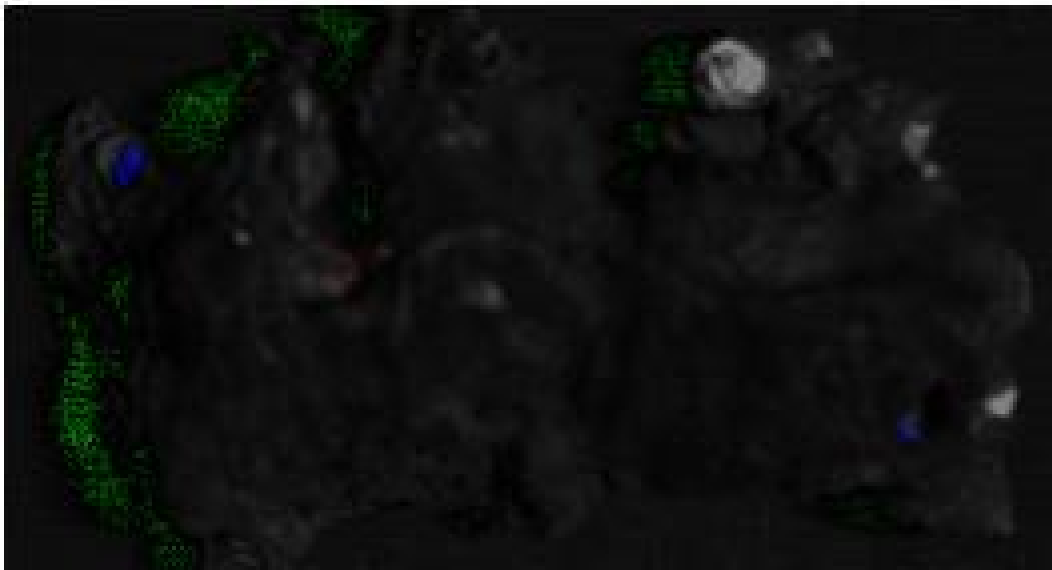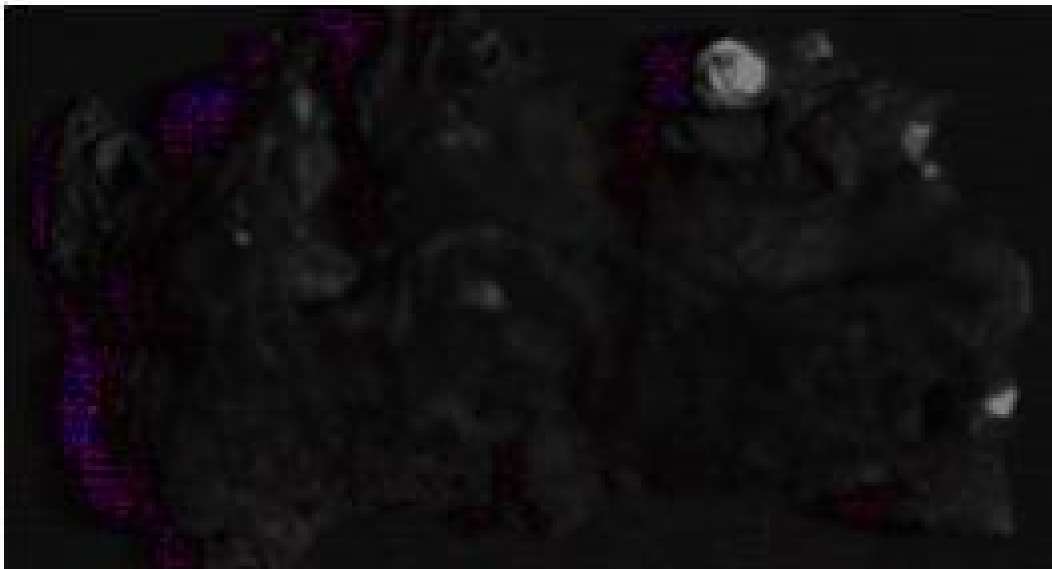
# PHY

**Background details:** From ?phyllosilicates' Shows information related to hydroxylated minerals including phyllosilicates. Fe/ Mg-OH bearing minerals (e.g., Fe/Mg-phyllosilicates) will appear red, or magenta when hydrated. Al/ Si-OH bearing minerals (e.g., Al-phyllosilicates or hydrated silica) will appear green, or cyan when hydrated. Blue colors are indicative of other hydrated minerals (such as sulfates, hydrated silica, carbonate, or water ice).
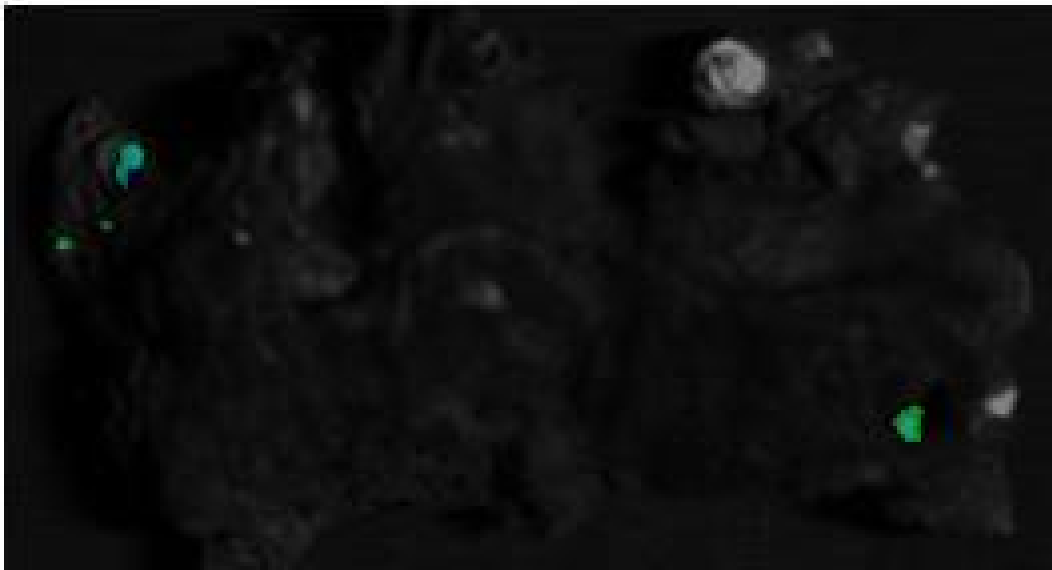
# PFM

**Background details:** From 'phyllosilicates with Fe and Mg' Shows information related to cation composition of hydroxylated minerals including Fe/Mg-phyllosilicate. Red/yellow colors indicate the presence of prehnite, chlorite, epidote, or Ca/Fe carbonate, while cyan colors indicate the presence of Fe/Mg smectites or Mg carbonate.

# PAL

**Background details:** From 'phyllosilicates with Al' Shows information related to cation composition of hydroxylated minerals including Al-phyllosilicate and hydrated silica. Red/yellow colors indicate the presence of Al smectites or hydrated silica, cyan colors may indicate the alunite, and light/white colors indicate the presence of kaolinite group minerals.

# HYS

**Background details:** From 'hydrated silica' Shows information related to Si/Al-hydroxylated minerals that can be used to differentiate between hydrated silica and Al-phyllosilicates. Light red/yellow colors indicate the presence of hydrated silica, whereas cyan colors indicate Al-OH minerals. Additionally, jarosite will appear yellow. Blue colors are indicative of other hydrated minerals (such as sulfates, clays, hydrated silica, carbonate, or water ice).