

## DETECTION OF A NEW SPECTRAL UNIT ON THE SOUTH POLAR REGION OF MARS

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In this work we report on the detection of a new spectral unit on the Martian southern polar region. Data used in this study have been acquired by the OMEGA (Observatoire pour la Minéralogie, l'Eau, les Glaces et l'Activité) imaging spectrometer on board the ESA mission Mars Express (MEX).

Spectrally, the unit is characterized by a 1  $\mu\text{m}$  band depth ~60% higher than the average value of surrounding terrain ( $\text{LAT} < -60^\circ\text{S}$ ), a distinctive shape of the reflectance peak at about 0.685  $\mu\text{m}$  and a steeper negative slope between ~0.8–1  $\mu\text{m}$ . The spectral parameters used to map the unit have been defined according to [1] and they show values similar to the one observed on the cratered Noachian terrain of the southern hemisphere ( $-60^\circ\text{S} < \text{LAT} < 0^\circ$ ) characterized by a mineralogical composition rich in pyroxene.

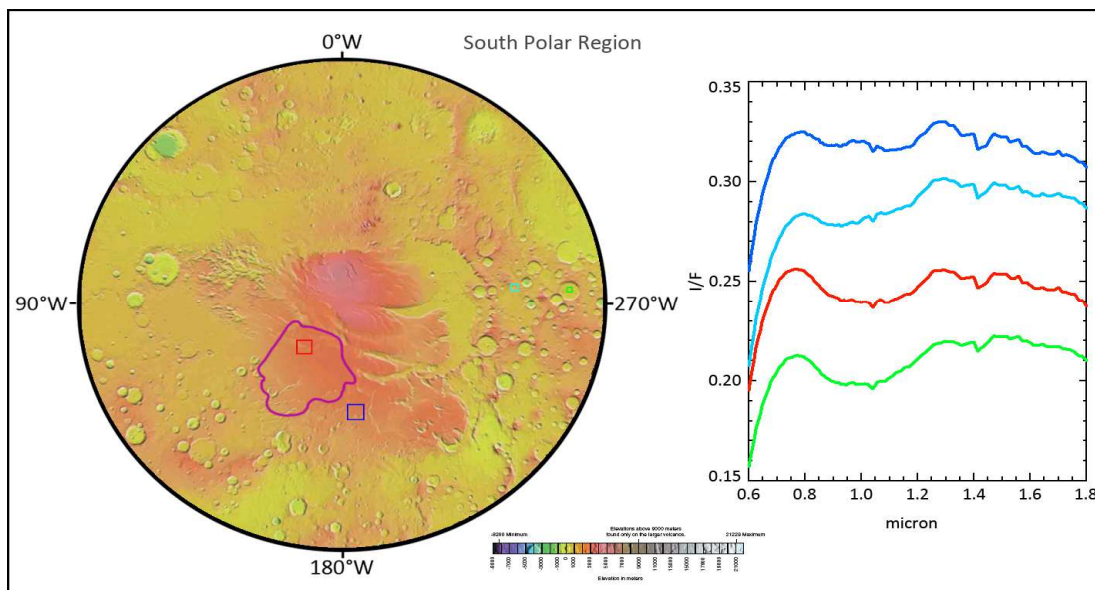
Morphologically, the considered area falls inside one of the flattest regions of Mars.

In Figure 1 we show the spectral unit location and its typical spectrum (red curve), in comparison with other spectra.

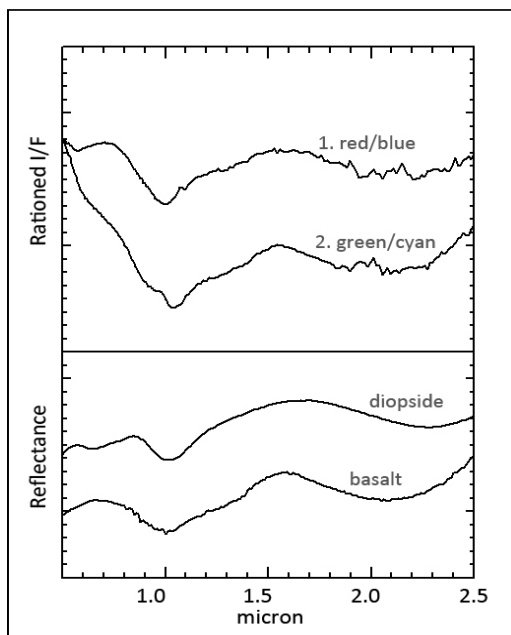
In **Fig. 2** we show the spectral ratios between the spectra of the sites of **Fig. 1**. The spectrum 1 has bands near 1.05 and 2.3  $\mu\text{m}$ . The best match of this spectrum is the diopside, while the spectrum 2 has absorptions near 1.04 and 2.1  $\mu\text{m}$  consistent with a basalt, probably LCP.

### Reference

Carrozzo et al., 2011. EPSC-DPS Joint Meeting 2011, held 2-7 October 2011 in Nantes, France, p.1096.



**Figure 1.** Here we show the mean spectrum taken in the flattest area (in red) of the South Polar Region compared to the mean spectrum of other terrains. The red ROI falls in the terrains where some spectral indices have values higher than in the other South Polar areas. The magenta curve is the contour that delimits the area with high values of BI1000. The ROIs are superimposed on the topography map based on data from the Mars Orbiter Laser Altimeter (MOLA) [<http://geopubs.wr.usgs.gov/>].



**Figure 2.** Ratioed spectra from Fig. 1. The absorptions near 1  $\mu\text{m}$  and in the range 2.1-2.2  $\mu\text{m}$  are consistent with high calcium pyroxene library spectra from CRISM spectral library, reported in the bottom part (file name: thec1pp20\_bdvnr and c1mm42\_bdvnr).