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VNIR spectroscopy of rock forming minerals mixtures: a tool to interpret planetary igneous compositions

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Abstract.

Visible and Near Infrared (VNIR) spectroscopy is a powerful technique to investigate and map the mineralogical composition of a Solar System body. Laboratory activities, measuring and analyzing minerals and their mixtures, rock powders and slabs, varying the particle and grain sizes, permit to improve the confidence on the spectra.s interpretation. Here we summarized a set of activity on spectral mixtures between plagioclases and mafic materials at 63 125 and 125 250 μm:

1. illustrating the spectral variations due to the different intensity of the plagioclase absorption varying it Fe^{2+} content once mixed with orthopyroxene - clinopyroxene, orthopyroxene - olivine poor and - olivine rich materials (Serventi et al., 2013);
2. an IMSA (Hapke, 1993) application to retrieve the endmember.s optical constants and to model the relative mineral abundances in intimate mixtures (Ciarniello et al., 2011) highlighting the influence of the mineral distribu- tions (Carli et al., 2014);
3. a spectra deconvolution with Modified Gaussians (MGM, Sunshine et al., 1990) to define spectral parameters (Band Center, Depth and Width) trends respect to the mineralogical composition of endmembers (mineral chemis- try) and mixtures (mineral abundances). Also discussing the influence of the sizes (Serventi et al., 2015).

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