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# Spectral variations in function of different gabbro textures: implications for remote sensing mapping

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Precise remote sensing of rock types rely on the quantification of mineral abundances. This is done in visible infrared reflectance domain by a comparison between mineral libraries and image spectra. Various models and techniques are available. Some consider a simple linear mixing of minerals without any interaction; some others try to retrieve the full and complex light radiative transfer through various grain size populations of minerals. In between, this work focuses on the analyses of the rock texture contribution to the shape of reflectance spectra. The aim is to identify an intrinsic rock type continuum, independent of environmental contributions, which could facilitate the comparison between mineral library built on powders and standard rock types.

The test site of the Pallet's gabbro (20 km SE of Nantes, France) displays: 1) an ophitic texture, with elongated tablets of feldspar encompassed by pyroxene (or amphibole) and 2) a corona texture, with olivine surrounded by an internal rim of orthopyroxene and an external rim of amphibole which growth at the expenses of plagioclase. We check the texture effect by measuring the reflectance of each sample with a FTIR spectrometer particularly sensitive to the key wavelength domain between 0.85 and 2.80 microns, and we control the mineralogical contribution by measuring individual mineral reflections and absorptions with the same FTIR plugged on an IR microscope. This procedure allows us to distinguish for each texture different continuum slope. It seems that when the texture starts to be degraded (feldspar tablets break apart), the overall bell shape of the reflectance shift from 0.9 to 1.1 $\mu$m for the corona texture and from 1.3 - 1.4 $\mu$m to 1.6 - 1.7 $\mu$m for the ophitic. Since those contributions are independent of the mineralogy, it appears important to add a texture effect in all precise remote sensing of rock types to prevent misidentification of minerals confused with textured changes.