Ber. Inst. Erdwiss. K.-F.-Univ. Graz	ISSN 1608-8166	Band 20/1	Graz 2014
PANGEO AUSTRIA 2014	Graz, 14. September 2014 – 19. September 2014		

Use of hyperspectral remote sensing for mineral exploration and lithologic mapping

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Reflected light spectroscopy is the study of light as a function of wavelength that has been reflected from a solid, liquid or gas. A number of minerals have diagnostic absorption features in reflectance spectra in the visible to short-wave infrared wavelength region. Such reflectance spectra can be also acquired remotely using "imaging spectrometers" or hyperspectral sensors. Based on the analysis of mineral absorption features, the hyperspectral imagery provides a tool to investigate the spatial distribution of the mineralogy of interest over a large area. This has application in mineral exploration and lithologic mapping activities. In this presentation such use of hyperspectral remote sensing is shown by examples from study areas in Spain and Greenland. The mapping of the spatial distribution of hydrothermal alteration minerals associated with the epithermal gold deposit of Rodalquilar, in southeast Spain, by analysis of airborne hyperspectral imagery is an example of the use of hyperspectral remote sensing for mineral exploration. In another example are shown the results of the lithologic mapping of the Sarfartoq carbonatite complex in central West Greenland using similar airborne hyperspectral data. The presentation outlines the possibilities and limitations of hyperspectral remote sensing for mineral exploration and lithologic mapping.