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New approaches in mineral mapping using diverse hyperspectral data as well as simulated EnMap and Sentinel 2 data

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Mineral mapping examples utilizing the VIS/NIR/SWIR/TIR regions will be demonstrated using diverse aerial hyperspectral (HS) image data (e.g., HyMap (2009 and 2010) and AHS (2011) data). Furthermore, a potential for mineral mapping when employing simulated EnMap data will be demonstrated. For mineral mapping employed to diverse HS datasets the new tools (QUANTools) which have been developed at the Czech geological Survey (CGS) [1, 2] were utilized.

These tools allow automatic detection of multiple absorption feature parameters to classify high spectral resolution data. One of the main advantages on using these new tools is that prior definition of endmembers is not requested to classify hyperspectral data. As inputs diverse reflectance as well as emissivity data either in a form of spectral libraries or image data can be used to model desire parameters. In that way QUANTOOLS also allow diverse sensor information fusion and integration.

In addition, the potential of Sentinel 2 data in mineral mapping will be also demonstrated. As a result, it will be possible to compare and summarize the results obtained when using aerial HS and future HS satellite data as well as state-of-the art superspectral orbital data.

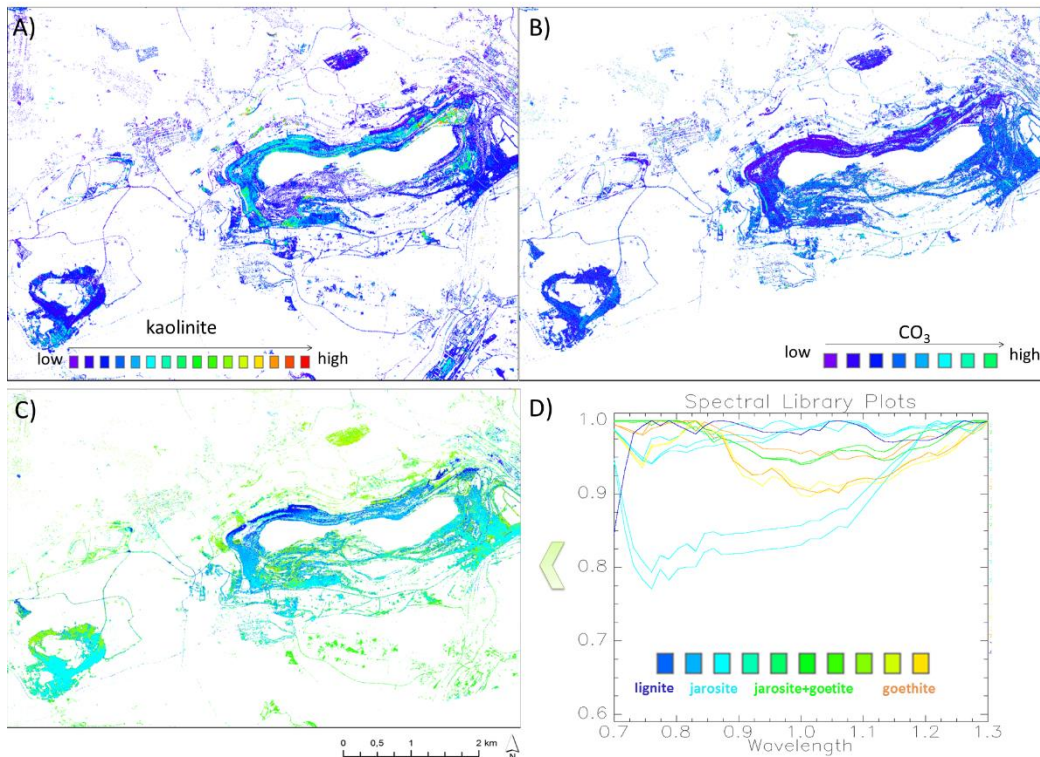


Figure 1: Mineral mapping using the QUANTools (2009 HyMap reflectance data acquired for the Sokolov lignite mines: Lítov – Medard): a kaolinite content (Fig. 1A), carbonate content (Fig. 1B) and the jarosite-goethite mineral stack (1C).

References:

- [1] Kopačková V. – Koucká, L. (2014): Mineral mapping based on automatic detection of multiple absorption features. EARSel eProceedings, 13(S1): 95-99. DOI:10.12760/02-2014-1-17
- [2] Kopačková V. – Koucká, L. (2015): A new version of QUANTOOLS, the spectral tools for mineral mapping. GRSG 26th Annual Conference 'Challenges in Geological Remote Sensing', ESA ESRIN, Frascati

