

LITHOLOGICAL MAPPING OF THE SARDUIYEH AREA, SE IRANIAN COPPER BELT, USING THERMAL BANDS OF THE ASTER

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ABSTRACT:

The study area is situated in the southern part of Central Iranian volcano- sedimentary complex, southeast of Kerman province. The dominant lithological units exposed at the area include felsic and mafic igneous rocks and the carbonate masses as well. The thermal bands of ASTER L1B and the AST_05 datasets were used to map lithological units. The thermal bands of L1B were atmospherically corrected and converted into the emissivity using Reference Channel, Emissivity Normalization and Alpha Residual algorithms. In order to map lithological units the band ratio and spectral angle mapper (SAM) algorithms were implemented on the L1B calibrated datasets and the AST_05. The spectra were derived from the image using spectral endmember selection procedure including minimum noise fraction (MNF), pixel purity index (PPI) and n-dimensional visualizer. Results were compared with the geological map of the study area to determine the accuracy of discriminated areas. Furthermore, the results of L1B calibrated datasets and the AST_05 were compared to each other. The Emissivity Normalization, Reference Channel and AST_05 successfully discriminated the felsic, intermediate to mafic, carbonate and sandstone lithological units but the data resulted from Alpha Residual were not satisfied.

TOPIC: Remote sensing applications

ALTERNATIVE TOPIC: Multi-spectral and hyperspectral remote sensing