

Determination of Alteration Zones Using Hyperspectral Imagery Based on Spectral Unmixing

By

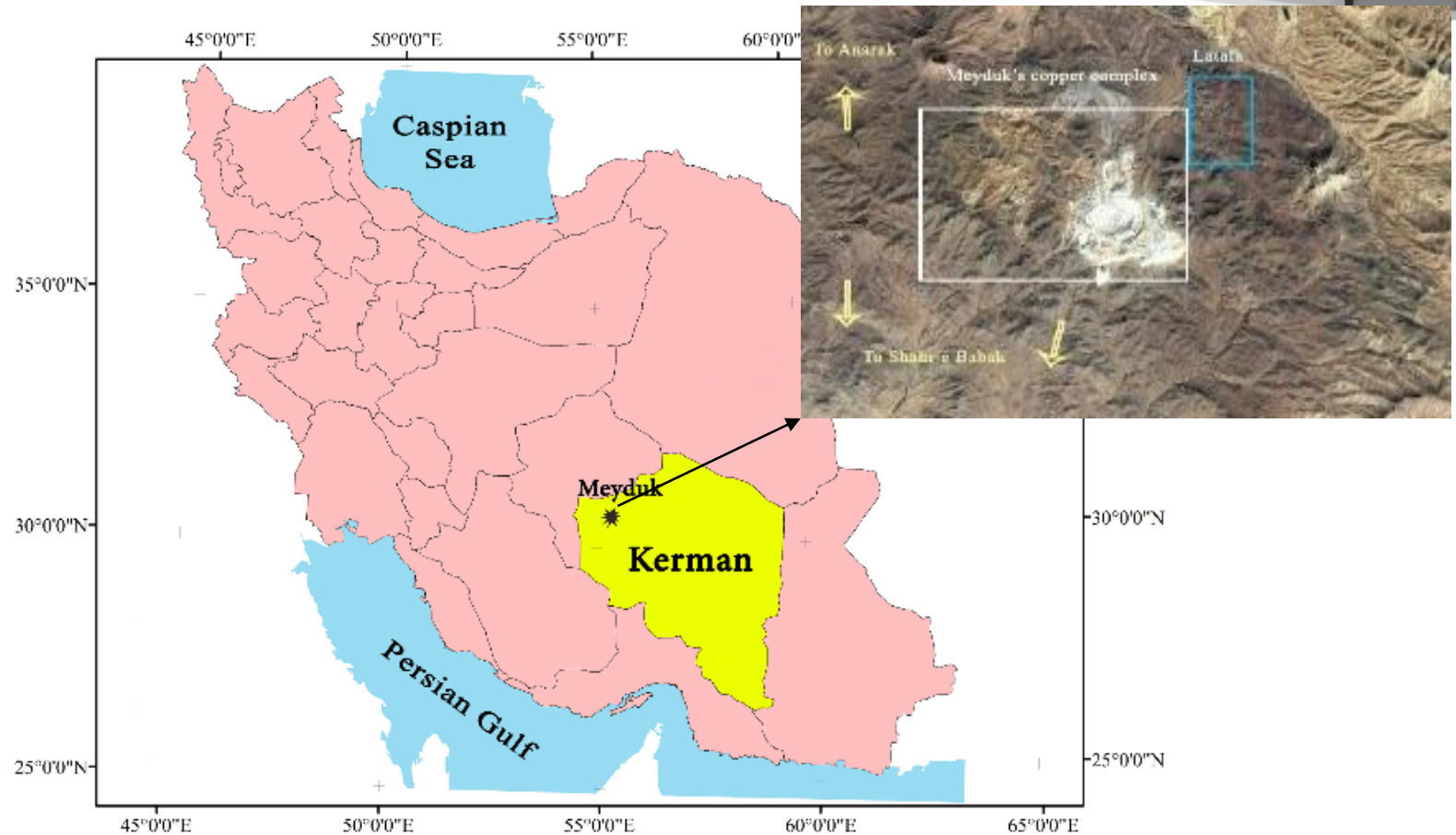
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Outlines

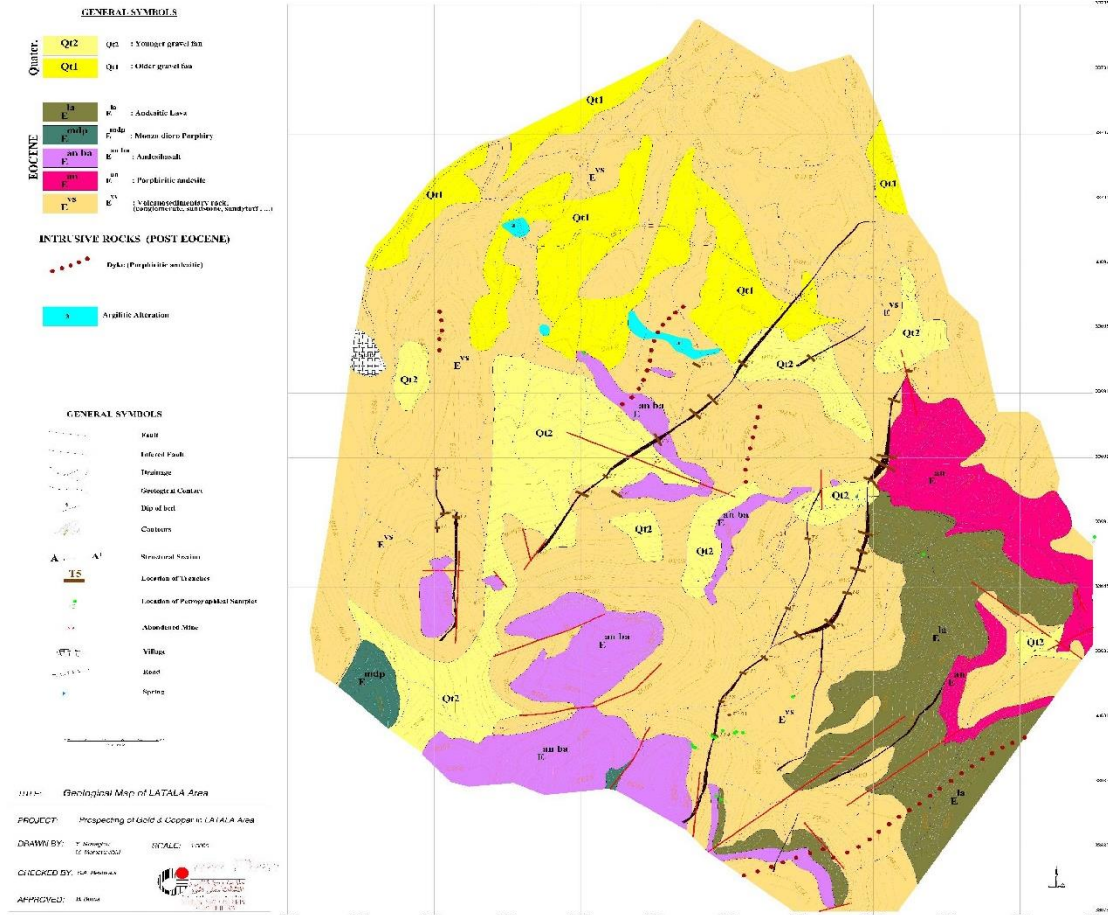
- Geology of the area
- Proposed Methods
 - Endmember estimation
 - Endmember extraction
 - Abundance map
- Results
- Conclusions

Geology of the area



The location of Meyduk in Kerman province and satellite image of the area that indicates relative position of Latala

Geology of the area



Geological map of the area

Proposed method

The spectral Unmixing was applied in three steps:

1) Endmember estimation

Estimation of endmembers using Hysime algorithm

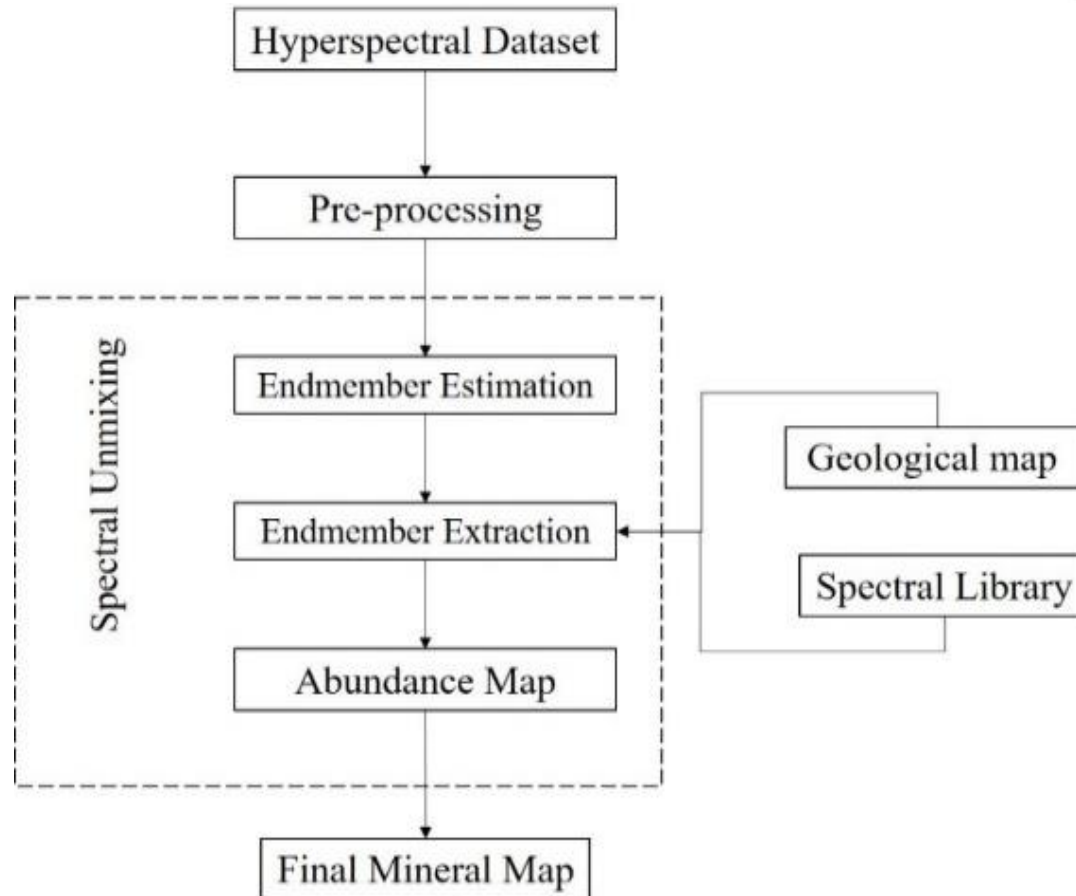
2) Endmember extraction

Extraction of enmembers using Sisal and N-finder

3) Abundance map

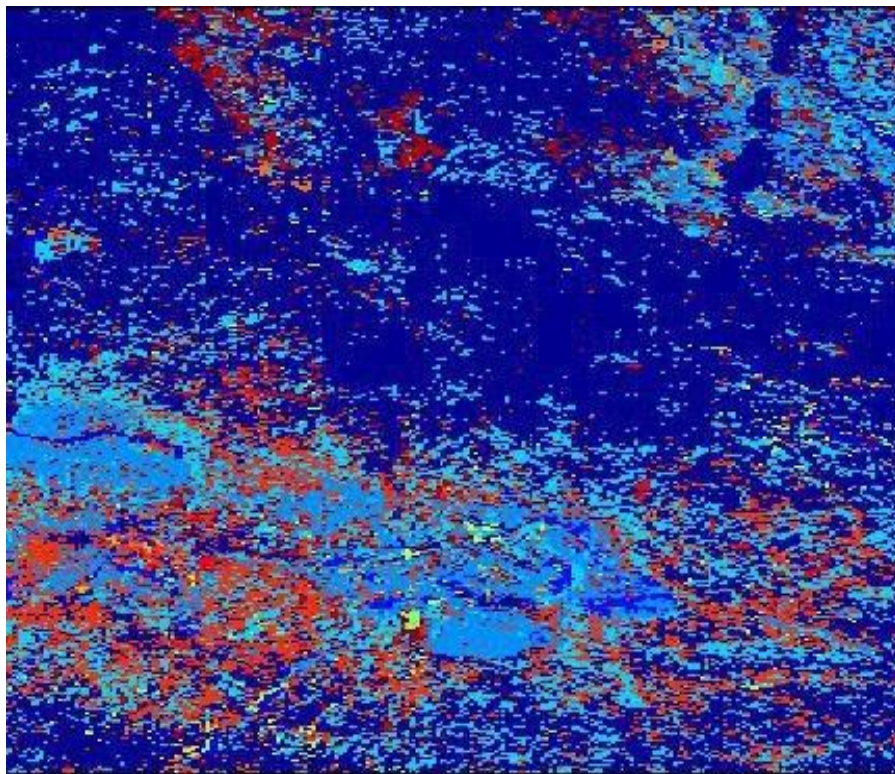
Calculation of vector abundance using fully least square error algorithm

Proposed method



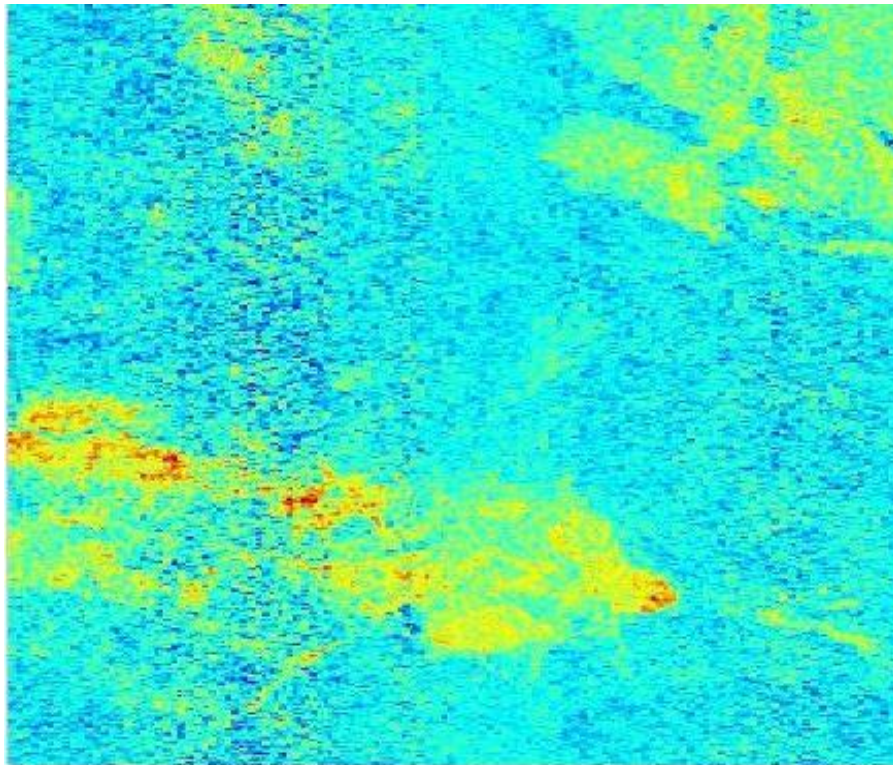
Overview on the proposed method

Results



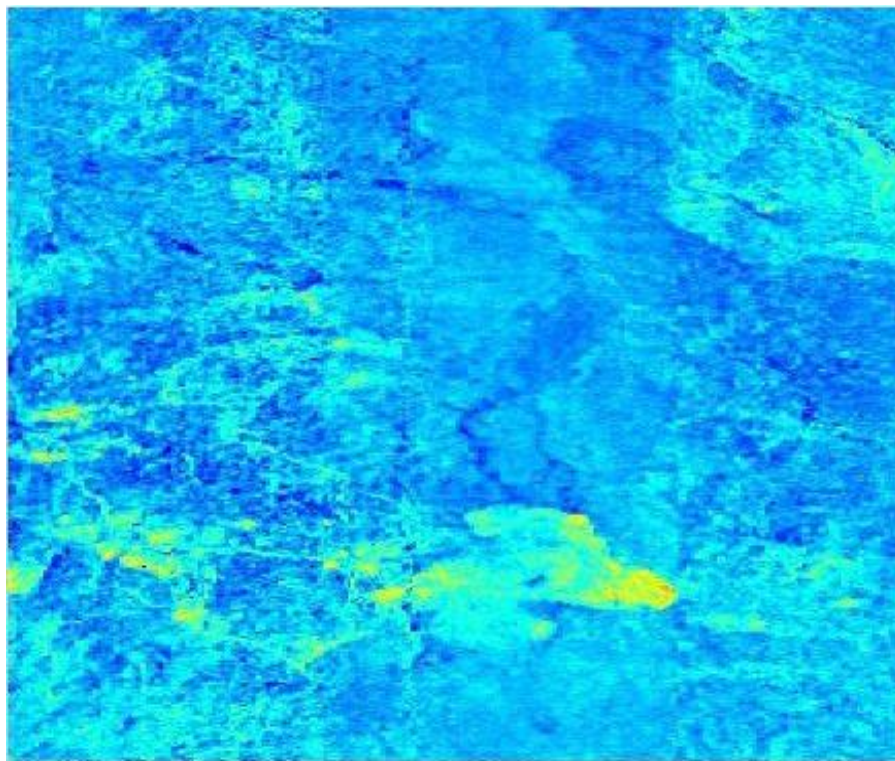
the classification map of extracted spectral signatures

Results



The abundance map of copper oxide

Results



The abundance map of iron oxide

Conclusions

In this study, we used hyperspectral data that obtained by Hyperion sensor in Meyduk area and recognized some prominent mineral ores like malachite, azurite, chalcantite, limonite and hematite.

We presented the prominent abundance maps and recognized the nature of each mineral ore using spectral signature. Finally, sericite and argillic alterations were detected that have good agreement with the geological report.