

# Detection of chromite bearing mineralized zones in Abdasht ophiolite complex using ASTER and ETM+ remote sensing data

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**Abstract** Podiform chromite ore deposits in ultramafic parts of ophiolite rock complexes can be detected using remote sensing data. This study focuses on the discrimination of chromite bearing mineralized zones using Landsat TM and Advance Spaceborne Thermal Emission and Reflection Radiometer (ASTER) satellite data in Abdasht ophiolite complex, south of Iran. Several image processing methods, including Log residual, Decorrelation Stretch, Band ratio and Mixture-Tuned Matched-Filtering (MTMF) have been evaluated for lithological mapping using Landsat ETM and ASTER data. The outcome showed that TIR band ratios of ASTER can discriminate quartzite, carbonate and mafic-ultramafic rocks in the ophiolite complex. Log residual, Decorrelation Stretch and MTMF methods were more capable than previous published ASTER methods specifically for lithological mapping at a regional scale. New geological map of Abdasht region was produced based on the interpretation of ASTER image processing results and field verification. Consequently, the proposed methods demonstrated the ability of ASTER and Landsat ETM data to provide information for detecting chromite host rock (serpentinized dunites) that is valuable for chromite prospecting in study area. Additionally, the techniques used in this study are subtle for exploration geologist and mine engineering to identify high-potential chromite-bearing zones in the ophiolite complex, minimizing costly and time-consuming field works.

**Keywords** ASTER . Landsat TM . Lithological mapping . Ophiolite complex . Chromite exploration