**The application of Landsat-8** **OLI/TIRS data for geological mapping: a case study from SE Iran**

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**Abstract**

New generations of advanced remote sensing data have been used by Earth scientists over last decades. This study presents the applicability of recently launched Landsat-8data for geological mapping. It has two sensors, namely Operational Land Imager (OLI) and the Thermal Infrared Sensor (TIRS) collect image data in nine visible, near-infrared, shortwave infrared bands and two longwave thermal bands. Sar Cheshmeh copper mining district in the southeastern part of the Urumieh-Dokhtar volcanic belt, SE Iran has been selected as a case study to show the capability of Landsat-8 bandsfor hydrothermal alteration and lithological mapping. Image processing results indicate that structural features and textural characteristics of igneous and sedimentary rocks, vegetated part and iron oxide minerals can be easily identified by visible and near-infrared (2 to 5) bands. Hydrothermal alteration areas associated with known copper deposits are distinguishable using shortwave infrared bands (7 and 8). Silicate minerals and lithological boundary are detectable using thermal bands at regional scale. Thermal infrared bands of Landsat-8 significantly improved the quality and availability of thermal infrared remote sensing data for geological mapping, which is broadly applicable for geological purposes in the future.

Key words: Landsat-8 data, Operational Land Imager, Thermal Infrared Sensor, Geological mapping.

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