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خلاصه مقاله:

This work aims to extract the mineralogical constituents of the Lahroud Hyperion scene situated in the NW of Iran. Like the other push-broom sensors, Hyperion images suffer from spectral distortions, namely the smile effect. The corresponding spectral curvature is defined as an across-track wavelength shift from the nominal central wavelength, and alters the pixel spectra. The common column mean adjusted in MNF space method was employed in this work to improve the processing accuracy by minimizing the smile effect before carrying out the atmospheric and topographical corrections. The mineral distributions were mapped by applying the standardized hyperspectral processing methodology developed by analytical imaging and geophysics (AIG). The spectral unmixing of the data resulted in the identification of five indicative minerals including natrolite, opal, analcime, kaolinite, and albite; and their spectra were employed for the generation of their distribution maps. Comparison of the results of the data processing with and without smile correction indicated a better classification performance after the smile correction. Quantitative validation of the final mineralogical map was performed using the 100 k geological map and reports of the region. Therefore, the coverage of the extracted minerals were investigated regarding the location of the lithological units in ArcGIS that implies a high coincidence. The mineral distributions in the final map show a high consistency with the geological map of the studied area, and thus it could be utilized successfully to reveal the mineralization trend in the region.

کلمات کلیدی:

Hyperion Data, Standardized Hyperspectral Processing Methodology, Smile Correction, Mineralogical Mapping

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