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Mapping of Alteration Zones in Mineral Rich Belt of South-East Rajasthan Using Remote Sensing Techniques

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Abstract : Remote sensing techniques have emerged as an asset for various geological studies. Satellite images obtained by different sensors contain plenty of information related to the terrain. Digital image processing further helps in customized ways for the prospecting of minerals. In this study, an attempt has been made to map the hydrothermally altered zones using multispectral and hyperspectral datasets of South East Rajasthan. Advanced Space-borne Thermal Emission and Reflection Radiometer (ASTER) and Hyperion (Level1R) dataset have been processed to generate different Band Ratio Composites (BRCs). For this study, ASTER derived BRCs were generated to delineate the alteration zones, gossans, abundant clays and host rocks. ASTER and Hyperion images were further processed to extract mineral end members and classified mineral maps have been produced using Spectral Angle Mapper (SAM) method. Results were validated with the geological map of the area which shows positive agreement with the image processing outputs. Thus, this study concludes that the band ratios and image processing in combination play significant role in demarcation of alteration zones which may provide pathfinders for mineral prospecting studies.

Keywords : ASTER, hyperion, band ratios, alteration zones, SAM
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