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Integrating data from remote sensing and geology for geological investigation in the eastern ends of Wadi Shati iron ore deposit

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Wadi Shatti deposit is a belt of upper-Devonian sedimentary formation including iron ore bearing layers, which extend over about 160 km, in E.NE-W.SW direction, on the northern border of the Murzuk basin, at its western and eastern ends. The iron ore bearing belt is covered by more recent formations which definitively conceal the ore outcrops, French study group (Stero Jexport, 1977). The study area is located in the south west part of the Libya Extend between 27º South and 28º North Latitude and 14º 45´ to 15º45´ East - longitude covering an area of nearly 10,000 sq km. a geological map of this area based on aerial photographs has been produced in 1984 and geological detailed study for the iron ore deposit has been done in 1974.This study examines the use of Remote Sensing (RS) technology in geological to discover any probable extensions of the iron ore deposit; the Landsat Thematic Mapper (ETM+) instruments have provided information relating to specific groups of minerals, specifically the iron oxides and clays. Image processing techniques were applied such as Maximum Likelihood supervised Classification image for bands (7, 3, 1) and band ratio images (3/1, 4/3, and 5/7). XRD and XRF are highly complementary materials analysis methods which when used together greatly improve the accuracy of phase identification and quantitative analysis. Few samples has been collected form the promising new areas, XRD and XRF analysis applied on the collected samples to be compared with the result which been detected from remote sensing study. Small iron ore occurrences are found along the eastern and eastern south end of wadi -shati iron ore belt, these founding of iron deposit bodies may suggest that the iron ore extend under the sand covered area.

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