Estimation of surface iron oxide abundance based on airborne hyperspectral data

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Mineral forms of iron oxide, such as hematite, goethite and jarosite, are widely distributed on the Earth's surface. They are used as important indicators for mineral exploration. A three-step procedure is developed in this study for quantitative estimation of surface iron oxide abundance based on airborne hyperspectral data. First, Spectral calibration of hyper-spectral imagery using atmospheric absorption features and data preprocessing. Secondly, Iron oxide abundance can be estimated accurately by crystal field transitions (CFT) spectral feature, which is the maximum absorption depth at the absorption center by A simple quadratic method and the continuum-removal method. Finally, we can get regression analysis results with datasets of chemical iron oxide laboratory measurements. The method was applied to CASI/SASI dataset for the Qilian mountain in Gansu, China. The results represented the enrichment zones of iron oxide within hydrothermally altered areas.