

Research on the Effects of Band Choice on Spectral Unmixing

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Abstract: Spectral unmixing has been widely used in the hyperspectral remote sensing for abundance estimation. Traditionally, it is thought that spectral unmixing using whole spectral region could achieve better results than just using limited number of bands. According to previous research, the sensitivity to the component abundance in the mixing solution varies with bands. Besides, the linearity of mixing model is different in different band ranges. Derivative of Ratio Spectroscopy (DRS) is a special method of spectral unmixing which can solve the abundance with single bands. In this paper, powder minerals were quantitatively mixed precisely and measured with field spectrometer, optimized bands with high linearity were achieved based on Derivative of Ratio Spectroscopy (DRS), and abundance inversion using Least Squares were performed both on full band range and optimized bands. The results revealed that effective band choice could improve the accuracy and efficiency of spectral unmixing.

Keyword: Spectral Unmixing; Band Choice; Derivative of Ratio Spectroscopy (DRS)