

Oriented Band Ratios Applied to Geobotanic and Ecological Studies

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Vegetation's spectral response in relation to bedrock and soils is, depending on the lithology, quite limited. Such response is in general subtle and frequently lack of a defined pattern in remote sensing imagery. In this paper a new technique to enhance subtle spectral differences in the vegetation cover is proposed. It is based on a number of parameters derived from spectral reflectance curves of vegetation. The number of parameters that can be extracted is a function of the spectral resolution of the actual sensor being used. Imaging spectrometry data allows parameters such as pigments, intraleaf water content, lignin, cellulose, starch and nitrogen to be analyzed. The technique relies on band ratios of pre-selected bands, followed by a Principal Component Analysis applied to the set of ratio images. The first three PC bands will concentrate most of the information related to the vegetation.

The method was successfully applied to Landsat TM and AVIRIS images of the Paraíso de Goiás area, Goiás State, Brazil. Further results show that the technique can be applied to vegetation mapping for use in geobotanical and ecological studies.