

UTILIZATION OF LINEAR MIXING MODEL APPLIED TO LANDSAT-TM DATA TO CHARACTERIZE BRAZILIAN AMAZON FOREST

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ISPRS Commission VII / Working Group 3

ABSTRACT

The necessity to provide periodical studies of the amazon region, characterizing its natural resources and anthropic alteration processes is a source of several Remote Sensing studies, many of them applying digital image processing techniques. Conventional methods of image classification underline, predominantly, in the spectral characteristics of the pixels, understanding them as composed by a single class of land cover. Usually, a digital number results from integration of the responses of many targets in the ground. In this way, the signal produced by the combination, in one pixel, of two or more classes of land cover will not be representative of none of them, resulting in a misunderstood classification. Therefore the spectral mixture is a limiting factor in an automatic classification approach. The aim of this work is to evaluate the use of synthetic images, obtained by a Linear Mixing Model, to characterize Brazilian amazon vegetation. The study area consists of approximately 690 km² of the Brazilian amazon, situated in the forest/savanna ("cerrado") contact region, between 11R00'S and 51R00'W to 52R30'W. For the methodology implementation, a visual interpretation of Landsat-TM data was performed, identifying classes of land cover (forest, second growth forest, savanna, bare soil, ...). A Linear Mixing Model was applied to generate three synthetic images ("vegetation", "soil" and "shade"). These images will be classified using a maximum likelihood algorithm. The product of this approach will be compared with the visual interpretation in a geographic information system, generating an error matrix. Kappa coefficient of agreement will be used to determine the classification accuracy obtained with the application of this methodology. In this way, this work intends to contribute to future space-time analysis of the large amazon region, estimating deforesting and monitoring land occupation.