SPECTRAL MEASUREMENTS FOR CORRECTING LANDSAT DATA FOR ATMOSPHERIC EFFECTS

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Target reflectance data are needed by all man and machine systems to obtain the unambiguous interpretation of Landsat data. In response to the need for correcting target reflectance spectral data, the capabilities of a wide range of techniques for determing and removing atmospheric parameters and effects from Landsat data are being evaluated.

Evaluated techniques include: 1) experimental method that includes transfering known ground reflectance to spacecraft measurements and 2) three empirical methods computerizing image processing techniques.

The approach that has been done is the conversion of radiance data from the satellite into reflectance values from a measurement technique based on ground measurements with an Exotech Model 100 A radiometer; it was carried out by G. Maracci and B. Sturm at the Joint Research Center in Ispra.

Two Chavez' techniques are used to correct ERTS digital data for atmospheric scattering and other associated haze effects.

Another empirical method is an extension of Chavez' Regression Technique: the Covariance Matrix Method (CMM) for estimating the additive path radiance in remote sensing data.

All the above mentioned methods are applied to each Landsat image that include Buenos Aires city and its environment. This place has been scanned temporally on each frame.

The differences on the spectral data owed to the atmospheric effect can be appreciated.

The three empirical methods are applied to the training area of each image and thus compared the differences among the three empirical methods.

At the same time the Landsat data are processed and compared with ground data. As a conclusion, in all the cases, there is a big influence of path radiance with different high levels and with time.

Another important conclusion has been obtained: there is a high correlation between histogram minimum local and CMM empirical methods with ground data. Empirical methods haze effects are of the same order than ground truth haze effects.