CORRECTING LANDSAT DATA FOR CHANGES IN SUN ANGLE, HAZE LEVEL, AND BACKGROUND REFLECTANCE

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ABSTRACT

This paper describes a computer program, called ATCOR, which is used to correct signatures obtained from LANDSAT data for differences in sun angle, haze level, and background reflectance.

A set of pre-computed tables is used in the calculations. These tables give the response of the LANDSAT multispectral scanner in each channel as a function of the solar zenith angle, $\theta$, the atmospheric haze level, $\tau$, the target reflectance, $R$, and the average background reflectance $R_B$. The tables also provide coefficients $a$ and $b$ such that for fixed, $\theta$, $\tau$, and $R$, the sensor response in a particular channel is given by

$$C = aR + b.$$  

The minimum value method to determine $\tau$ and $R_B$ is determined by averaging over the data. Appropriate $a$ and $b$ coefficients are then looked up in the tables. In most applications the signatures from a given segment (the training segment) are corrected to correspond to the same values of $\theta$, $\tau$, and $R$, as some other segment. This is done by determining the $a$ and $b$ coefficients for each segment independently. From these coefficients the transformation is determined which corrects the training segment statistics.

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