

The Estimation of the NDVI Calculation Error when Using Empirical Methods for Atmospheric Correction

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Abstract. The paper presents the results of the analysis of different empirical atmospheric correction method applicability to the Resurs-P spacecraft hyperspectral data for the NDVI calculation. The methods such as FF (Flat Field), DOS (Dark Object Subtraction), DOS1% (Improved Dark Object Subtraction), and COST (Cosine Approximation Model with atmospheric transmittance taken into account) as well as the atmospherically corrected value calculation using the Lambert's formula are considered and used. The paper analyses the merits and drawbacks of each method. It is concluded that the empirical methods taking into account the atmospheric effects improve the NDVI calculation accuracy. The atmospheric correction effect of DOS1% and COST is the best; the mean deviation values do not exceed 5%. The results obtained in this study may be applied to solving the problems requiring the knowledge of underlying surface spectral radiance factors.

Keywords: Earth remote sensing, atmospheric correction, hyperspectrometer, spectral radiance, NDVI