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Aerosol optical thickness retrieval and GIS distribution analysis using the fast atmospheric correction method: a case study in Cyprus

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Atmospheric correction is an important step of the pre-processing of satellite images. The darkest pixel is found to be one of the most simple and effective atmospheric correction methods. However, there is a need to develop a fast correction algorithm that will combine both RT equation so as to remove the atmospheric effects from satellite imagery as well to retrieve the aerosol optical thickness (AOT) . Indeed, a fast atmospheric correction method based on the radiative transfer equation and the darkest pixel method was developed to retrieve AOT values from visible and NIR bands of satellite images. The algorithm was used to develop GIS maps that illustrated the AOT distribution in Limassol, Cyprus. An accuracy assessment was conducted by comparing the AOT values as generated by the GIS maps with the in-situ AOT values retrieved from the Cimel and Microtops sun photometers. There was strong agreement between the AOT values indicated on the GIS map with the in-situ measurements.

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