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On the Application of OPAC in the Remote Sensing of Aerosols

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Abstract

This paper gives an account of the use of remotely sensed Aerosol Optical Depth (AOD) imagery for the determination of particulate matter (PM) concentrations.
One of the tasks of the Belgian Interregional Environment Agency is to provide information to the population as well as governmental institutes on the air quality in the country. One approach to reach this goal is to use the data collected by measuring sites and to interpolate these data to produce pollution maps. These maps commonly provide information on the concentrations of O3, NO2, SO2 and PM10 for Belgium. However, when it comes to mapping ultra-fine particulate matter (PM2.5) the required information for interpolation from measuring stations is lacking due to an inadequate amount and spatial spread of measuring stations of PM2.5.

A possible approach to still provide information on spatially explicit PM2.5 pollution fields is to make use of satellite observations, more specifically by measuring AOD and the Angstrom coefficient. Many studies have been performed and papers published which investigate the relationship between aerosol optical depth and particulate matter - especially PM2.5 - at field level.

This paper gives outcome on what we have learned from the use of the OPAC model (Optical Properties of Aerosols and Clouds) to establish relationships between AOD and PM under cloud-free atmospheric conditions. An example of OPAC model application will be presented.

Key words: Remote Sensing, AOD, PM2.5, OPAC