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#### [Volume XL-8](#)

Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XL-8, 271-276, 2014  
www.int-arch-photogramm-remote-sens-spatial-inf-sci.net/XL-8/271/2014/  
doi: 10.5194/isprsarchives-XL-8-271-2014

## Estimation of aerosol optical depth over Dehradun (India) using simple model for atmospheric radiative transfer in multiple scattering approximation

M. Mehta

Photogrammetry and Remote Sensing Department, IIRS, Dehradun, India

**Keywords:** SMART, multiple scattering approximation, AWiFS, aerosol optical depth

**Abstract.** Aerosol optical depth retrieval over land surface using remote sensing employs the use of radiative transfer simulations and/or simultaneous measurements of atmospheric parameters at the time of satellite pass. Also, an accurate estimate of land surface parameters is also required in order to separate the atmospheric component from the land surface reflectance reaching at-sensor. In addition to empirical and semi-empirical approaches, amongst the most widely used methods to retrieve the aerosol properties from satellite measurements are radiative transfer codes used in either forward or inverse modes. As most of them are computationally complex, henceforth, efforts are made to formulate approximate models. In this study, we have tried to estimate aerosol optical depth using one such established physically based model, namely, SMART (Simple Model for Atmospheric Radiative Transfer) code in multiple scattering approximation for aerosols over first band (0.52–0.59  $\mu\text{m}$ ) of RESOURCESAT-AWiFS sensor. The aim of the analysis was to find out an approach to decouple aerosol effects from Top of atmosphere signals recorded by AWiFS sensor using multiple scattering approximations for aerosols. The model is first calibrated for aerosol asymmetry parameter for one dataset each of summer and winter seasons respectively and subsequently validated for 4 different datasets (2 summer and 2 winter) against the MODIS atmosphere product for aerosol optical depth. The results show that the difference between simulated vs. MODIS AOD fall within MODIS expected errors for the aerosol product.

[Conference Paper](#) (PDF, 685 KB)

Citation: Mehta, M.: Estimation of aerosol optical depth over Dehradun (India) using simple model for atmospheric radiative transfer in multiple scattering approximation, Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XL-8, 271-276, doi: 10.5194/isprsarchives-XL-8-271-2014, 2014.

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