



The Red Versa NIR Plane to Retrieve Broken-Cloud Optical Depth from Ground-Based Measurements

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BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 32 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. A new method for retrieving cloud optical depth from ground-based measurements of zenith radiance in the RED and near infrared (MR) spectral regions is introduced. Because zenith radiance does not have a one-to-one relationship with optical depth, it is absolutely impossible to use a monochromatic retrieval. On the other side, algebraic combinations of spectral radiances such as NDCI while largely removing nonuniqueness and the radiative effects of cloud inhomogeneity, can result in poor retrievals due to its insensitivity to cloud fraction. Instead, both RED and NIR radiances as points on the RED vs. NIR plane are proposed to be used for retrieval. The proposed retrieval method is applied to Cimel measurements at the Atmospheric Radiation Measurements (ARM) site in Oklahoma. Cimel, a multi-channel sunphotometer, is a part of AERONET - a ground-based network for monitoring aerosol optical properties. The results of retrieval are compared with the ones from Microwave Radiometer (MWR) and Multi-Filter Rotating Shadowband Radiometers (MFRSR) located next to Cimel at the ARM site. In addition, the performance of the retrieval method is assessed using a fractal model of cloud...

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