

Use of 315nm channel of sky radiometer to retrieve columnar ozone amount

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Abstract

Sky radiometer data are being used to study aerosol and cloud parameters as well as water vapor content of our atmosphere. In order to further extend the utility of this instrument to measure columnar ozone concentration, we propose ozone concentration retrieval method using 315nm channel data of sky radiometer. The proposed method consists of (i) calculating calibration constant of direct intensity at 315nm using *in situ* observation data, which is an alternation of traditional Langley method, and (ii) retrieval technique of ozone concentration using sky radiometer observation data. For the limited set of data, the retrieved ozone concentrations using proposed method agreed well with directly measured ozone concentration by Brewer Spectro-photometer with root mean square error (RMSE) of 0.02atm-cm, validating the reasonable accuracies of *in situ* calibration and ozone retrieval techniques. The proposed method will be further validated using more observation data. The error analysis study suggests that the proposed method can have low retrieval error at high solar zenith angle and vice versa. The retrieval error differs with magnitudes of error

associated with calibration constant, measured direct intensity and aerosol and Rayleigh optical thicknesses.