



## **A novel method to retrieve the nocturnal aerosol optical depth with a CCD Laser Aerosol Detection System**

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Aerosol optical depth (AOD) is a crucial parameter in describing the atmospheric pollution and analyzing the influences of aerosol on the radiative equilibrium. Currently, there is lack of method that can measure the nocturnal AOD precisely and continuously. In this study, a novel method was developed to retrieve the nocturnal AOD based on a remote sensing instrument named charge-coupled device-laser aerosol detective system (CCD-LADS). CCD-LADS consists of a CCD camera, a continuous laser, a fisheye lens and related filters. The AOD can be calculated by integrating the aerosol extinction coefficient profile retrieved from CCD-LADS measurements. The retrieved AOD was validated with AERONET and MODIS datasets. The comparison shows good agreement.