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A novel method to measure the ambient aerosol phase function based on dual ccd-camera

Yuxuan Bian, Chunsheng Zhao, Jiangchuan Tao, Ye Kuang, and Gang Zhao
Department of Atmospheric and Oceanic Sciences, School of Physics, Peking University, Beijing, China (bianyx@pku.edu.cn)

Aerosol scattering phase function is a measure of the light intensity scattered from particles as a function of scattering angles. It's important for understanding the aerosol climate effects and remote sensing inversion analysis. In this study, a novel method to measure the ambient aerosol phase function is developed based on a dual charge-coupled device(ccd) camera laser detective system. An integrating nephelometer is used to correct the inversion result. The instrument was validated by both field and laboratory measurements of atmospheric aerosols. A Mie theory model was used with the measurements of particle number size distribution and mass concentration of black carbon to simulate the aerosol phase function for comparison with the values from the instrument. The comparison shows a great consistency.