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ITERATIVE METHOD OF DUAL-WAVELENGTH LASER RATIO FOR PARTICLE SPECTRUM

Nianwen Cao and Sipeng Yang
Nanjing University of Information Science and Technology, China

This paper presents a method to obtain the aerosol lidar ratio and particle spectrum simultaneously using a dual-wavelength lidar when the aerosol particles meet the Junge distribution. It analyzes the relationship between the aerosol particle ratio, particle spectrum and particle complex refractive index. The results show that the particle properties will have a great impact on the lidar ratio. If the selected lidar ratio is not suitable, the two-wavelength extinction coefficient obtained from the Fernald method is directly used for inversion of the particle spectrum, which will cause great uncertainty. In this paper, a lidar ratio iteration method is introduced to solve the influence of improper lidar ratio selection on particle spectrum inversion, then conducted simulation calculations and analysis. The simulation results show that the lidar ratio iteration method effectively solves the problem of uncomfortable lidar ratio selection, and can obtain relatively accurate lidar ratio and particle spectrum parameters at the same time.

Biography

Nianwen Cao has completed his PhD from Anhui Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, in 1999. He is Professor and engaged in Atmospheric Remote Sensing Research by Lidar in Nanjing University of Information Science and Technology. He has published more than 30 papers in reputed journals.

nwcao@nuist.edu.cn