

理论研究

关于折射率对散射光场分布影响的研究

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摘要

根据Mie散射理论,采用理论计算和实验相结合的手法,研究了光散射现象以及散射介质的折射率对散射光场分布的影响.通过对空气中不同折射率的散射介质形成的散射光场光强的实验比较,论证了散射介质折射率的实部变化对散射光强的影响不大,其主要影响是通过相位的变化来实现的,也即散射介质折射率的虚部变化对光强的影响很大,在实际应用中不可忽略.这一结论对以散射光场的分布为基础的各种研究具有一定的指导意义.

关键词 [光散射](#) [Mie散射理论](#) [折射率](#) [辐照强度](#)

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A Study on Effect of Refractive Index on Scattered Light Field Distribution

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Abstract

The phenomena of light scattering often occur in the natural environment. The Mie scattering theory, which is derived from the Maxwell equations, exactly represents the distribution of scattered light. The refractive index of mediums is directly related to the distribution of scattered light. And it is very important to carry out a qualitative analysis and a quantitative analysis. In this paper, by means of experimentations and numerical analyses, it is confirmed that the real part variation of the refractive index of mediums influences the distribution of irradiance intensity less than the imaginary. This result can be used for many studies which base on the distribution of scattered light.

Key words [light scattering](#) [Mie scattering theory](#) [refractive index](#) [distribution of the irradiance intensity](#)

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