Modeling Electromagnetic Scattering from Particles

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Particles of both spherical and nonspherical shape are often encountered in the natural environ- ment. Examples include atmospheric clouds and aerosols. Light scattering from these particles creates radiative forcing effects that influence the Earth's climate [1]. Additionally, electromagnetic scattering from a particle can provide information about the physical properties of the particle in an unintrusive manner. Furthermore, applications of electromagnetic scattering to remote sensing of physical systems of single or multiple particles requires a detailed knowledge of the interaction between the particle and the field. We apply the Discrete Dipole Approximation (DDA) to study electromagnetic scattering from single spherical and nonspherical particles. Our aim is to quantify simple patterns in the scattering process which aid in characterizing the physical properties of a scattering particle [2, 3]. We also examine in detail how an electromagnetic field interacts with a particle at the microscopic level to establish the macroscopic scattering, absorption and extinction cross sections.

REFERENCES

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