Interstellar dust analogue mixture of graphite and fayalite: computational and experimental light scattering properties

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Interstellar graphite and silicate dust analogue samples are of utmost importance for laboratory simulations to interpret astrophysical data obtained through space and ground based observatories. The light scattering properties of a graphite and silicate dust analogue laboratory model is studied in this work. The shape and size averaged values of scattering parameters phase functions and polarizations are calculated using Discrete Dipole Approximation (DDA) based computations at three incident wavelengths 543.5, 594.5, and 632.8 nm respectively. The calculated results are then compared with the experimentally measured scattering parameters [1–3]. Two modeling approaches are used for a comparative study to fit the theoretical and experimentally acquired data considering a size distribution of 0.3 to 5 μm. The effects of modeling parameters: percentage composition, number of dipoles and number of random orientation directions are studied and other important findings are presented in this paper.

References

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