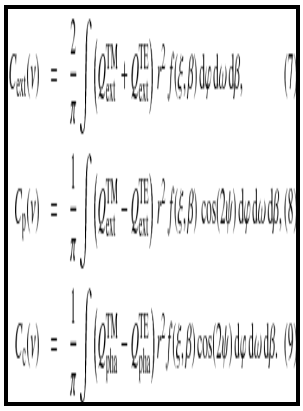
New constraints on the composition of interstellar grains from observations of extinction and polarization

University of Texas at Austin - Interstellar extinction and polarization



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-New constraints on the composition of interstellar grains from observations of extinction and polarization
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Interstellar extinction and interstellar polarization: Old and new models

These effects partially cancel when the extinction is computed, but the height of the absorption edge—a key diagnostic for ISM abundances—remains overestimated.

A Dynamical Constraint on Interstellar Dust Models from Radiative Torque Disruption

Download figure: Extinction cross sections calculated for several grains are shown in Figures and.

ACCURATE MODELING OF X

In the regime where the optically thin regime , Equation for spherical grains becomes which implies that an increase in porosity produces a decrease in the scattering cross section. A number of other approximations exist to efficiently compute scattering and absorption in various limiting cases. Theoretically, if carbonaceous grains are separate, they are not expected to be efficiently aligned see Section 8.

Interstellar extinction and polarization

The inclusions are of a single radius and their centres are chosen randomly. To obtain , we require , proportional to the Fourier transform of f see Equation.

A Dynamical Constraint on Interstellar Dust Models from Radiative Torque Disruption

Our model being as simple as possible was applied to Ducati J.

Composite interstellar grains

The radius of the host composite grain is set to 0. We assume that the ice mantle is thick enough such that it can behave like bulk ice.

ACCURATE MODELING OF X

However, for plausible dust evolution scenarios, dust grains are likely more complicated than single-material spheroids or even ellipsoids. To date, no theoretical attempts have been made to relate the grain internal structure with observable quantities i.

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