Optical properties of aggregates for various fractal dimensions and number of monomers

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Dust grains emitted form the cometary nuclei are considered to be aggregates [1]. Optical properties of these aggregates are necessary to calculate temperature and radiation pressure force on the aggregate. We will investigate the optical properties of aggregates with a view to parameterizing them as a function of number of monomer and fractal dimension [2].

Table 1. shows the exemplary result of absorption efficiencies based on DDA (Discrete Dipole Approximation) method [3] for 2 types of aggregate model (i.e. Ballistic Particle-Cluster Aggregate and Ballistic Cluster-Cluster Aggregate) [4]. Absorption efficiencies are calculated for the aggregate with same size parameter for each monomer but with different numbers of monomers for BPCA and BCCA. Preliminary calculation shows that the absorption efficiencies are largely influenced by the number of particles. Further calculation will be conducted for various particles.

Keywords: optical properties of aggregate; fractal dimension; number of monomers

Table 1: Absorption efficiencies of grains with various number of monomers for BPCA and BCCA. F D denotes fractal dimension. Complex refractive index is 1.5+0.li.

	$N = 256$	512	1024
$BPCA(FD = 2.98)$	4.1170E-01	5.1753E-01	6.4804E-01
$BCCA(FD = 1.93)$	4.1270E-01	5.2594E-01	6.5861E-01

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