Aggregate Model of Cometary Dust: An Application to Comet Levy 1990XX

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In the present work, the light scattering properties of comet Levy 1990XX are studied through simulations using Ballistic Particle-Cluster Aggregation (BPCA) or Ballistic Cluster-Cluster Aggregation (BCCA) aggregates of up to 128 spherical monomers of different compositions (e.g., silicates, carbonaceous compounds etc.) and the best fit theoretical polarization curve is generated using the Superposition T-matrix code. The best fit refractive indices coming out from the present analysis show silicate behavior when monomer radius is a_m = 0.13μm and provide significantly good results on the maximum and negative degrees of linear polarization at a single wavelength, $\lambda = 0.485$ μm.

Keywords: Cometary dust; Light scattering; Linear polarization; Aggregate particles.

References

[1] G. P. Chernova, K. Jockers and N. N. Kiselev, *Icarus* **103**, 38 (1993).
[2] L. Kolokolova, H. Kimura, N. Kiselev and V. Rosenbush, *Astron Astrophys* **463**, 1189 (2007).
[3] H. Kimura, L. Kolokolova and I. Mann, *Astron Astrophys* **449**, 1243 (2006).