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Emission Features of Large Aggregate Particle

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The comets supply the dust particles of irregularly shaped aggregate composed of silicates and other minerals. We present how the irregular particle contributes to the silicate emission features observed in the infrared wavelengths. We use a fractal aggregate (BPCA: Ballistic Particle-Cluster Aggregate) as an irregular particle. To compute the absorption/emission efficiencies of particles, we apply a DDA code to the fractal aggregate, and for a comparison Mie theory to a sphere with the equivalent volume to the aggregate. We found even when no significant emission feature at a wavelength of 10μm appear for a large sphere, the silicate features exist for a large fractal aggregate with equivalent mass to the sphere. It is predicted in general that the large aggregate still shows significant emission features found in a small particle.

Keywords: dust aggregate; silicate emission features

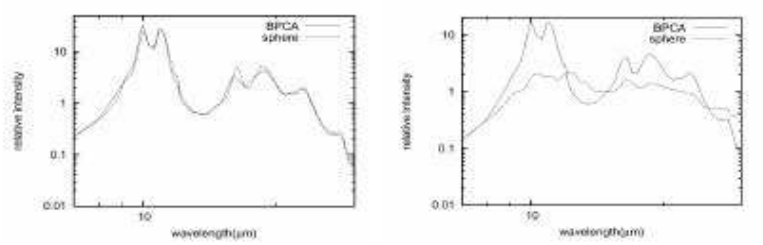

Figure 1: Emission features of crystalline olivine. The radius of particle is 0.8μm in the left panel and 5.0 μm in the right panel. The range of wavelength is from 7.0μm to 30μm.