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Radial Drift of Dust Grains in Protoplanetary Disks by Stellar Radiation Pressure

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The *Stardust* mission and spectroscopic observations suggested the existence of crystalline silicates in comets. Although the comets were found in the outer part of protoplanetary disks, these silicate grains were thought to be processed or crystallized inner hot region. This suggests that in the early phase of protoplanetary disks, there was a large scale mixing which connects the inner and outer regions of disks.

We study the dust motion in a protoplanetary disk, and obtain the condition under which the porous aggregates in the inner disk can be carried to the comet formation region by the stellar radiation pressure. We estimate the lower limit of the ratio of stellar gravity to radiation pressure for a porous aggregate to move outward. For the dust model we assume BPCA and BCCA model. We also calculate the value of the ratio using the Mie theory. Based on these results, we discuss whether such radial drift is possible in the early solar system.

Keywords: protoplanetary disks, comets, crystalline silicates, stellar radiation pressure, porous dust aggregates