Fast grain coagulation method for numerical simulations

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Résumé

Dust grains have a critical influence over many astrophysical processes, therefore knowing their size is of utmost importance. We know that they grow by coagulation during star and planet formation, but grain coagulation is computationnally expensive for 3D simulations. I will present a method to include grain coagulation in analytical or numerical calculations, at a negligible cost. I will also present a fast algorithm to calculate the ionization of the grains and the gas, in order to obtain the magnetic resistivities for MHD simulations. Finally, I will show simulations, using those methods, that clarify the location and timescale of grain growth, as well as its large scale effects.

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