

Abstract Submitted
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**Clustering Dynamics of Ultra-fine
Particulate Systems**¹ MEENAKSHI DUTT, JAMES ELLIOTT, University of
Cambridge — Length scales of particles and their surrounding medium strongly de-
termines the nature of their interactions with one another and their responses to
external fields. We are interested in systems of ultrafine particles (0.1 - 1.0 micron)
such as volcanic ash, solid aerosols, or fine powders for pharmaceutical inhalation
applications. We develop a numerical model for these systems using the Derjaguin-
Muller-Toporov (DMT) adhesion theory along with the van der Waals attraction
between the particles and their contact mechanical interactions. We study the dy-
namics of these systems in the absence and presence of gravity by controlling the
particle size, and thereby, the surface properties of the particles. The high surface
energies of these particles causes them to agglomerate as they gravitationally settle.
We explore their internal structure as a function of their particle size.

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