Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

Collision Driven Particle Dynamics Simulations for Analyzing Flows of Particulate Sprays and Jets DEBANJAN MUKHERJEE, TAREK ZOHDI, University of California, Berkeley — This work presents a detailed overview of the development of a computer simulation tool based on neighbor-list collision driven particle dynamics to investigate the flow of particulate sprays and jets. A detailed discussion of a hierarchical modeling approach to represent coupled, multi-physical phenomena through simple models for underlying physical interactions is presented. The models are based on the concept of individual "particles" or "discrete elements" - which could be actual particles in some applications, and a meso-scale idealized computational unit in others. Particularly, the work focuses on the overall flow behavior in the presence of collisions and interactions with surrounding fluid, and representative simulation examples are presented to illustrate the dispersed particle ensemble dynamics. The simulations were found to be reasonable in performance time using readily available computational resources. From the perspective of engineering software development, the work also briefly addresses the issue of simulation architecture and user front-end. Since this is part of an ongoing research, the status of current development, future research directions, and possibilities of open collaborations both in terms of simulation development and applications will be addressed

Debanjan Mukherjee
None

Date submitted: 02 Aug 2013 Electronic form version 1.4