Abstract Submitted
for the DFD20 Meeting of
The American Physical Society

The role of Reynolds number on the settling dynamics of arbitrary-shaped particles on a wall[1] TIFFANY SIMMONS, Texas AM University, College Station, TX., MOHSEN DAGHOOGHI[2], University of Houston-Clear Lake, Houston, TX., IMAN BORAZJANI, Texas AM University, College Station, TX. — A particle-wall collision model is implemented in a sharp-interface curvilinear immersed boundary (CURVIB) method to simulate fluid structure interaction (FSI) in a viscous fluid with irregular shaped bodies colliding and settling on a flat surface. The particle's equations of motion are modified after the collision by identifying the contact point and considering it as the instantaneous center of rotation at each time instant until the equilibrium (stable) state is reached. The rebound of particle off the wall is not considered which is a good assumption for particles with low Stokes number. A major advancement in this work is identifying the equilibrium (stable) final state for irregular shapes. Grid, domain, and boundary condition independence studies are performed. Multiple simulations are preformed to show how modifying the Reynolds number will impact the fluid dynamics of different particles and how this will affect the body-surface collision. Tested particle shapes include sphere (for validation), ellipsoid, cylinder, pyramid, and a jagged, irregular shape.

[1]Computational resources were provided by Texas AM High Performance and Research Center
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Date submitted: 01 Aug 2020 Electronic form version 1.4