

Large scale discrete element simulation for wet particles

Yuki Ishida¹ and *Mikio Sakai²

¹School of Engineering, The University of Tokyo, Japan.

²School of Engineering, The University of Tokyo, Japan.

*Corresponding author: mikio_sakai@n.t.u-tokyo.ac.jp

The DEM was often employed in the simulations of a granular flow. At present, the DEM was not substantially applied to an industrial system because of the huge calculation cost. To solve this problem, we develop a coarse grain model of the DEM. In this study, we newly developed the coarse grain model involving the liquid bridge force. We performed verification tests. In the current study, we compared the particle behavior of coarse grain model with that of original particle system in the moist fluidized beds. Comparing their bed height, pressure drop, and bubble size, the behavior of the both were in good agreement quantitatively and qualitatively. We proved the adequacy of the developed coarse grain model, and we were greatly evolved DEM towards application to an industrial system.

Keywords: DEM, Coarse grain model, Liquid bridge force, Fluidized bed, Gas-solid flow