# Application of the DEM coarse grain model to 3D simulations of a large-scale fluidized bed

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Fluidized beds are widely used in industry. In this study, we perform DEM-CFD numerical analysis of a fluidized bed. The DEM is a Lagrangian approach. Therefore, it is difficult to use the DEM to model industrial powder processes. To solve this issue, we have developed the DEM coarse grain model. In this model, the coarse grain particle represents a group of original particles. The model has been applied to 2D systems. In this study, we verified the DEM coarse grain model in the 3D system by numerical examples. We compared the bed height, the pressure drop and the bubble size between the coarse grain model and the original system. Moreover, by the experiment, we validated the coarse grain model when the coarse grain ratio was high. We apply the coarse grain model to the larger system in the future.

**Keywords:** DEM, Coarse grain model, Fluidized bed, Powder process, Gas-solid flow