

Discrete Element Modeling of Particles for FLUENT

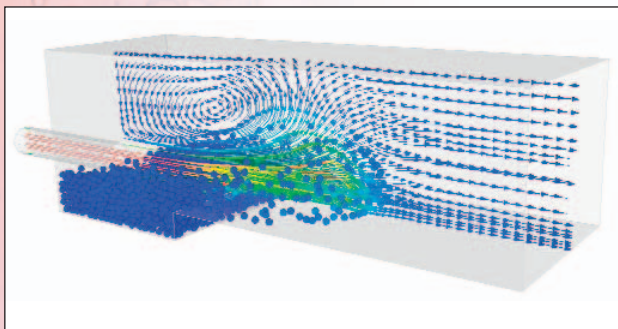
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DEM SOLUTIONS is the developer of EDEM, discrete element method (DEM) software for particle flow simulation. EDEM is used to simulate the dynamics of solid particles including inter-particle and particle-wall collisions.

Fluent and DEM Solutions have jointly developed a new plug-in for FLUENT that can be used to simulate the dynamics of multiphase fluid-particle systems. The EDEM plug-in complements the multiphase models already available in FLUENT by adding the ability to include particle attributes such as shape and size distribution, material properties, and initial placement, and to obtain detailed information on collisions, clumping, adhesion to boundary surfaces, and exchange with the surrounding fluid. In addition to the fluid drag, other forces such as gravity, electrostatic, electromagnetic, bonding, and cohesion can be applied to the particles. An open interface allows additional user-defined forces and coupling with other physical models.

The EDEM plug-in can provide important information on multiphase flows across a broad range of industries and applications. It is useful in applications where the particles must be transported efficiently, without damage or excessive buildup, or when particle-equipment interactions are critical. Some examples are the optimization of pneumatic transport systems, fluidization, filtration, prevention of sand damage, and reactor transport.

The EDEM software can be used by itself to model single-phase systems of solid particles. Some examples of single phase applications include bulk material handling in conveyors, chutes and hoppers, rock drilling, excavation, agricultural machinery, and various pharmaceutical manufacturing processes. ■



Entrainment of particles in an air-stream using FLUENT-EDEM co-simulation

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