

WORKGROUP FOR MULTIPHASE FLOWS

Disperse multiphase flows - LBM

Grant number

-

Project title

Lattice-Boltzmann-Simulation for disperse multiphase flows

Project leader

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Keywords

Lattice-Boltzmann-approach, numerical calculation, none-spherical particle

Short description of the project

The Lattice Boltzmann method (LBM) allows for an efficient solution of the fluid mechanic conservation equation due to its simple implementation and high concurrency. Recently an in-house program was extended to incorporate finitely large solid particles of arbitrary shape (Hölzer 2002). In the course of this project this method shall be used to determine the flow forces for stationary, non-spherical particles in various laminar and turbulent flow conditions. Subsequently similar studies are conducted for mobile, non-spherical particles.

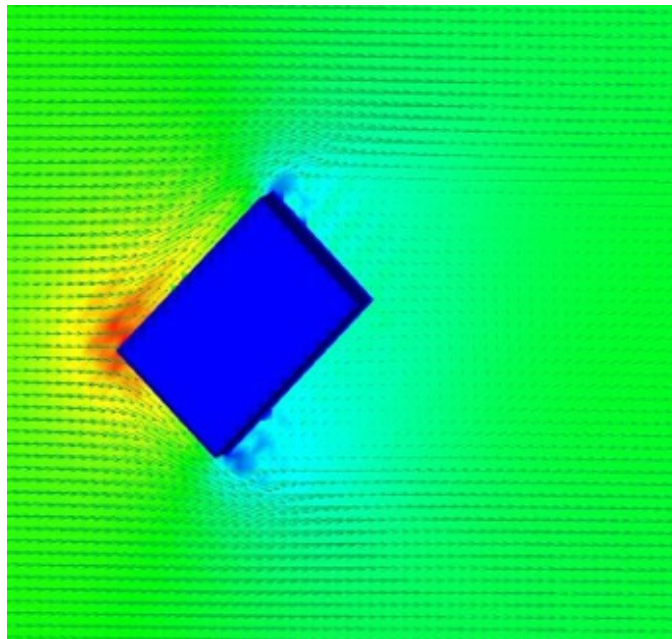


Photo: Flow around a cuboid

The obtained results are then used to extend Euler/Lagrange models for non-spherical particles. This involves especially consideration of particle orientation and flow coefficients for certain particle shapes. Further works will involve particle swarms. Thereby the modification of the flow and turbulence as well as collisions between particles will become relevant. In these studies

simple, homogeneous, and isotropic turbulence is initially assumed and the particles Stokes number and shape are varied.
