Drag law for bidisperse gas-solid suspensions containing equally sized spheres

Why is drag important in hydrodynamic modeling?
Learn more. Drag plays a crucial role in hydrodynamic modeling and simulations of gas-solid flows,which is significantly affected by particle Reynolds number,solid volume fraction,heterogeneity,granular temperature,particle-fluid density ratio,and so on.

What causes complex scale-dependence of drag?
Both domain-averaged kinetic properties and local averaged dimensionless drag are sampled and analyzed. It is revealed that the complex scale-dependence of drag is attributed to the multiscale effects of heterogeneous structures and particle fluctuating velocity.

Why is drag scale-dependent?
It is revealed that the complex scale-dependence of drag is attributed to the multiscale effects of heterogeneous structures and particle fluctuating velocity. The granular temperature and the scalar variance of solid volume fraction are also found to be scale-dependent.

It was proposed that in a bidisperse gas-solid suspension, the drag forces acting on the two particle species could be expressed as fD1 = - ?11?U1 - ?12?U2 fD2 = - ?21?U1 - ...

DOI: 10.1021/IE800171P Corpus ID: 51738391; Drag law for bidisperse gas-solid suspensions containing equally sized spheres @article{Yin2009DragLF, title={Drag law for bidisperse gas ...

In this study, we constructed from lattice-Boltzmann simulations a drag correlation for bidisperse gas-solid suspensions containing equally sized particles that are moving with...

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Manuscript "A drag law for bidisperse gas-solid suspensions containing equally-sized spheres" was accepted by Ind. Eng. Chem. Res. in April 2008. Discover the world"s ...

Figure 2. Normalized fluid-particle drag in a monodisperse fixed bed. The squares were obtained from our simulations. They agree very well with the drag law by Koch and Sangani4 [eq 23, ...

A drag law with improved accuracy has been established for bidisperse fixed beds. For suspensions with particle-particle relative motions, the hydrodynamic particle-particle ...

generalized to suspensions containing three or more particle species. Fluid-Particle Drag in Mono- and

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Polydisperse Gas-Solid Suspensions Drag in the context of averaged ...

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We consider a model of a bidisperse gas-solid suspension in which the particles are subject to gravitational and Stokes drag forces and undergo elastic solid-body collisions. ...

In section II, we introduce the fluid-particle drag in the context of averaged continua equations for gas-solid flows, discuss common drag correlations used in past studies, and propose a new ...

Figure 1. Radial distribution of particles in our initial configurations. ?1 + ?2) 0.34. The triangles represent the radial distribution averaged from 18 configurations, each of which contains 1268 ...

In this work, we conducted simulations to characterize (a) the drag forces in low-Re bidisperse suspensions where d1 != d2, and (b) the drag forces in bidisperse suspensions with ...

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However, the inter-penetrating continua models for flowing binary gas-solid suspensions require more general drag force models, where different types of particles can ...

The flow and resulting drag force in suspensions consisting of monodisperse, solid spheres, and non-Newtonian liquids have been studied via direct numerical simulations. The liquids are ...

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The proposed model captures the fluid-particle drag results obtained from lattice-Boltzmann simulations of bidisperse and ternary suspensions at particle mixture Reynolds ...

This paper describes the results of numerical simulations for polydisperse sedimentation of equal-sized spheres, e.g. particles of different density. Using the Stokesian ...

Lattice-Boltzmann simulations of low-Reynolds-number fluid flow in bidisperse fixed beds and suspensions with particle-particle relative motions have been performed. The ...

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