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The particle-in-a-tube analogy for a multiparticle suspension. (English) Zbl 1135.76400

Int. J. Multiphase Flow 22, No. 3, 515-525 (1996).

Summary: A simple analogy between a multiparticle suspension and a single particle in a tube has been obtained by using the concept of "hydraulic diameter". Fully theoretical derivations for the effect of the wall on the single particle enable the solid-fluid interaction force to be estimated with no empirical input for the viscous and the inertial flow regimes. The analogy is successfully tested in the intermediate flow regime and finally the expansion characteristics of homogeneous fluidised beds is obtained, in good agreement with the Richardson & Zaki (1954) equation, by using experimental data on the terminal settling velocity of a lone particle in a tube.

MSC:

[76Txx](#) Multiphase and multicomponent flows

Cited in 1 Document

Keywords:

[multiparticle systems](#); [drag force](#); [voidage function](#); [wall function](#)

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