Abstract Submitted
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**Lattice Boltzmann simulation of the behavior of spherical and nonspherical particles in a square pipe flow**[1] TAKAJI INAMURO, HIROFUMI HAYASHI, MASAHIRO KOSHIYAMA, Department of Aeronautics and Astronautics, Kyoto University — The lattice Boltzmann method (LBM) for multicomponent immiscible fluids is applied to the simulations of solid-fluid mixture flows including spherical and nonspherical particles in a square pipe. A spherical solid particle is modeled by a droplet with strong interfacial tension and large viscosity, and consequently there is no need to track the moving solid-liquid boundary explicitly. Nonspherical (discoid and biconcave discoid) solid particles are made by applying artificial forces to the spherical droplet. It is found that spherical particles move around stable positions between the wall and the center of the pipe. On the other hand, a biconcave discoid particle moves along a helical path around the center of the pipe with periodic oscillations in its orientation. The radius of the helical path and the polar angle of the orientation increase as the hollow of the concave becomes larger.

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Takaji Inamuro
Department of Aeronautics and Astronautics, Kyoto University

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