

عنوان مقاله:

Immersed Boundary-Lattice Boltzmann Simulation of the Freefalling of an Elliptical Particle Subjected to Pulsatile Flow

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خلاصه مقاله:

Pulsatile flow is a common issue in a variety of natural and industrial applications ranging from slurry flow to biological flow. In this paper, the effect of pulsatile flow on the sedimentation manners of a vertical elliptical particle located in a narrow box is investigated. For this purpose, the combination of direct-forcing immersed boundary method and lattice Boltzmann method is used. The code and algorithm are successfully verified. Then, the effect of pulsatile flow and more specifically pulsating frequency is taken into account and discussed. Also, the effect of gravity and collision force among solid surfaces is involved. In this study, pulsatile flow is considered as an opposing flow and imposed to the bottom of the box. It is noteworthy to add that the force resulting from the particle acceleration is also considered. From the findings, it is revealed that pulsatile flow can considerably change the settling manners and more specifically pulsating frequency would add to this difference. The importance of pulsatile flow and its effects on the settling manners of a single elliptical particle is revealed and the possibility of extending the employed computational method is shown.

کلمات کلیدی:

Pulsatile flow, Lattice Boltzmann method, Immersed boundary method, Non-circular particles, Pulsatile frequency

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