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A Gas-kinetic BGK Scheme for the Finite Volume Lattice Boltzmann Method for Nearly Incompressible Flows

Weidong Li, Wei Li

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## 1 Highlights

- 2 • A gas kinetic BGK scheme based finite volume lattice Boltzmann method is proposed;
- 3 • The proposed method achieves second order accuracy of time and space in one step;
- 4 • For the steady state, the present scheme becomes the exact central-difference scheme;
- 5 • The proposed scheme is a reliable and accurate tool for incompressible flows;
- 6 • The proposed scheme works on arbitrary meshes.

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