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A novel lattice BGK approach for low Mach number combustion. (English) Zbl 0963.76072
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Summary: We present an extended lattice Boltzmann BGK model for simulation of low Mach number flows with significant density changes. For applications to reactive flows, this new model is coupled with a finite difference scheme for solving transport equations for energy and species. With a boundary fitting formulation and local grid refinement, the scheme enables accurate computations of low Mach number reactive flows in complex geometry on the simplest Cartesian grid. Examples of reactive flows around porous burners are presented.

MSC:

76M28 Particle methods and lattice-gas methods
76M20 Finite difference methods applied to problems in fluid mechanics
76V05 Reaction effects in flows
80A25 Combustion

Cited in **1** Review
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Keywords:

extended lattice Boltzmann BGK model; finite difference scheme; transport equations; boundary fitting formulation; local grid refinement; low Mach number reactive flows; porous burners

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