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Some progress in lattice Boltzmann method. I: Nonuniform mesh grids. (English)

Zbl 0868.76068

J. Comput. Phys. 129, No. 2, 357-363 (1996).

Summary: A new lattice Boltzmann algorithm is proposed to simulate the Navier-Stokes equation on arbitrary nonuniform mesh grids. The new algorithm retains the advantages of the lattice Boltzmann method: parallel algorithm, ease of programming, and ability to incorporate microscopic interactions. A simulation of flow in a two-dimensional symmetric channel with sudden expansion is carried out using the new algorithm on a nonuniform mesh. The results of the simulation are in agreement with previous experimental and numerical results.

MSC:

76M25 Other numerical methods (fluid mechanics) (MSC2010)
76P05 Rarefied gas flows, Boltzmann equation in fluid mechanics

Keywords:

Navier-Stokes equation; parallel algorithm; microscopic interactions; two-dimensional symmetric channel with sudden expansion

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