عنوان مقاله:

Stabilization of Lattice Boltzmann BGK Method for high Rayleigh Natural convection

محل انتشار:

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خلاصه مقاله:

In this article a relaxation time method is introduced to solve natural convection problems. A two dimensional square differentially heated cavity filled with air (Pr=0.71) is presented to illustrate that Lattice Boltzmann BGK method (LBGK) is stable at low lattice numbers and without any turbulent models. Furthermore, Multiple-Relaxation-time (MRT) methods with significantly high Rayleigh numbers (up to RA=109) are stable and in accordance with previous researches in the literature. The importance of having a method to choose relaxation times is then shown. The best relaxation time is selected based on the Rayleigh number (Ra), specified Prandtl number (Pr) and chosen Lattice size (number of Lattices). Consequently, the power of the method described in this article is emphasized.

کلمات کلیدی:

Lattice Boltzmann BGk Method, Natural Convection, Square cavity, Relaxation times

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