The Hong Kong Polytechnic University
Department of Applied Mathematics

Colloquium

A fully implicit finite difference method for lattice Boltzmann equations

by

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Abstract

The most popular method for solving the lattice Boltzmann equations is the LBM, in which the CFL number is equal to 1. In order to use a larger time step, we develop a fully implicit finite difference method to solve the lattice Boltzmann equations. After discretizing the equations, a large sparse nonlinear system is constructed and solved by a parallel highly scalable, Newton-Krylov-RAS algorithm. We focus on the linear and nonlinear preconditioner for the system. Several benchmark problems are solved by the proposed fully implicit finite difference method. The numerical results show the high accuracy and the efficiency of our fully implicit finite difference method.

Date :   31 August, 2017 (Thursday)
Time :   11:00a.m. – 12:00noon
Venue : TU801, The Hong Kong Polytechnic University

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