Abstract

Shallow water equations or commonly referred as Saint-Venant equations are used to model fluid phenomena. These equations can be solved numerically using several methods, like Lattice Boltzmann method (LBM), SIMPLE-like Method, Finite Difference Method, Godunov-type Method, and Finite Volume Method. In this paper, the shallow water equation will be approximated using LBM or known as LABSWE and will be simulated in performance of parallel programming using OpenMP. To evaluate the performance between 2 and 4 threads parallel algorithm, ten various number of grids Lx and Ly are elaborated. The results show that using OpenMP platform, the computational time for solving LABSWE can be decreased. For instance using grid sizes 1000×500, the speedup of 2 and 4 threads is observed 93.54 s and 333.243 s respectively.

Keywords: shallow water equations, lattice boltzmann method, parallel algorithm.