عنوان مقاله:

Accelerating high-order WENO schemes using two heterogeneous GPUs

محل انتشار:

مجله مکانیک کاربردی محاسباتی, دوره 48, شماره 2 (سال: 1396)

تعداد صفحات اصل مقاله: 10

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خلاصه مقاله:

A double-GPU code is developed to accelerate WENO schemes. The test problem is a compressible viscous flow. The convective terms are discretized using third- to ninth-order WENO schemes and the viscous terms are discretized by the standard fourth-order central scheme. The code written in CUDA programming language is developed by modifying a single-GPU code. The OpenMP library is used for parallel execution of the code on both the GPUs. Data transfer between GPUs which is the main issue in developing the code, is carried out by defining halo points for numerical grids and by using a CUDA built-in function. The code is executed on a PC equipped with two heterogeneous GPUs. The computational times of different schemes are obtained and the speedups with respect to the single-GPU code are reported for different number of grid points. Furthermore, the developed code is analyzed by .CUDA profiling tools. The analyze helps to further increase the code performance

کلمات کلیدی:

Multi-GPU, CUDA, OpenMP, WENO schemes, Compressible viscous flow