GRID FREE EULER FLOW SOLVER WITH CUDA COMPUTING

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Abstract

Graphics Accelerators are increasingly used for general purpose high performance computing applications as they provide a low cost solution to high performance computing requirements. Intel also came out with a performance accelerator that offers a similar solution. However, the existing application software needs to be restructured to suit to the accelerator paradigm. Master-slave software architecture has been employed to enable two-dimensional and threedimensional grid-free Euler flow solvers in GPGPU computing platforms. Results showing significant improvement in the performance are presented in this paper. Convergence histories and aerodynamic forces obtained from GPGPU computing are compared with that of sequential computing results.

Keywords: Grid-free Solver, MPI, Cluster Computing, GPGPU, CUDA