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GPU Accelerated DG-FDF Large Eddy Simulator[1] MEDET INKARBEKOV, Al-Farabi Kazakh National University, AIDYN AITZHAN, University of Pittsburgh, SHERVIN SAMMAK, Center for Research Computing, University of Pittsburgh, PEYMAN GIVI, University of Pittsburgh, AIDARKHAN KALTAYEV, Al-Farabi Kazakh National University — A GPU accelerated simulator is developed and implemented for large eddy simulation (LES) of turbulent flows. The filtered density function (FDF) is utilized for modeling of the subgrid scale quantities. The filtered transport equations are solved via a discontinuous Galerkin (DG) and the FDF is simulated via particle based Lagrangian Monte-Carlo (MC) method. It is demonstrated that the GPUs simulations are of the order of 100 times faster than the CPU-based calculations. This brings LES of turbulent flows to a new level, facilitating efficient simulation of more complex problems.

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