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Discontinuous Galerkin Methods and High-Speed Turbulent Flows MUHAMMED ATAK, University of Stuttgart, JOHAN LARSSON, University of Maryland, CLAUS-DIETER MUNZ, University of Stuttgart — Discontinuous Galerkin methods gain increasing importance within the CFD community as they combine arbitrary high order of accuracy in complex geometries with parallel efficiency. Particularly the discontinuous Galerkin spectral element method (DGSEM) is a promising candidate for both the direct numerical simulation (DNS) and large eddy simulation (LES) of turbulent flows due to its excellent scaling attributes. In this talk, we present a DNS of a compressible turbulent boundary layer along a flat plate at a free-stream Mach number of M=2.67 and assess the computational efficiency of the DGSEM at performing high-fidelity simulations of both transitional and turbulent boundary layers. We compare the accuracy of the results as well as the computational performance to results using a high order finite difference method.

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