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Boundary treatment for the Recovery discontinuous Galerkin method with application to the Navier-Stokes equations PHILIP JOHNSON, ERIC JOHNSEN, Univ of Michigan - Ann Arbor — The Recovery discontinuous Galerkin (DG) method is a highly accurate approach to computing diffusion problems, which achieves up to 3p+2 convergence rates on Cartesian cells, where p is the order of the polynomial basis. Based on the construction of a unique and differentiable solution across cell interfaces, Recovery DG has mostly been investigated on periodic domains. However, whether such accuracy can be sustained for Dirichlet and Neumann boundary conditions has not been thoroughly explored. We present boundary treatments for Recovery DG on 2D Cartesian geometry that exhibit up to 3p+2 convergence rates and are stable. We demonstrate the efficiency of Recovery DG in context with other commonly used approaches using scalar shear diffusion problems and apply it to the compressible Navier-Stokes equations. The extension of the method to perturbed quadrilateral cells, rather than Cartesian, will also be discussed.

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