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DNS of shock-turbulent boundary layer interaction SUMAN MUPPIDI, KRISHNAN MAHESH, University of Minnesota — A novel DNS/LES capability for high speed viscous flows on unstructured grids is being developed. Shock-turbulent boundary layer interaction results in flow separation, shock unsteadiness, and increased aerodynamic and thermal loads. This paper focuses on the DNS of a Mach 3 turbulent boundary layer flow past a 24 degree compression corner. In our simulations, the upstream turbulent boundary layer is obtained by roughness–induced transition of a laminar boundary layer, and not by rescaling methods. The simulations are performed at the conditions of experiments by Bookey et al (AIAA Paper 2005). The results will be compared to experimental data. We will present the evolution of the boundary layer flow across the shock, low frequency unsteadiness, and the upstream influence of the corner. Both numerical issues and their physical implications will be discussed.

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