

Abstract Submitted
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Preliminary LES of Hypersonic Shock/Turbulent Boundary Layer Interaction CLARA HELM, PINO MARTIN, University of Maryland, College Park — Preliminary results from the Large Eddy Simulation (LES) of two hypersonic Shock/Turbulent Boundary Layer Interactions (STBLIs) are presented. First it is demonstrated with the simulation of a Mach 3 interaction over a 24° compression ramp that the LES method used is capable of resolving the relevant features of the complex dynamics present in separated STBLIs. Features such as the separation low-frequency dynamics, turbulence magnification, shear layer dynamics, and wall and skin friction distributions are validated against the Direct Numerical Simulation (DNS) data of the same Mach 3 flow. The LES is then validated for the computation of hypersonic conditions by simulating an attached Mach 7 STBLI generated by an 8° compression ramp and comparing results to DNS data of the same flow conditions. Lastly, initial results from the LES of a Mach 7 separated interaction over a 33° compression ramp at experimentally achievable conditions will be presented and discussed. This work is supported by the Air Force Office of Scientific Research under grant AF/9550-10-1-0164.

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