

Abstract Submitted
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DNS of transition in supersonic boundary layers¹ SUMAN MUPPIDI, KRISHNAN MAHESH, University of Minnesota — We are developing the numerical capability to simulate laminar-to-turbulent transition in high speed external flows in complex geometries. Transition to turbulence is associated with increased aerodynamic and thermal loads, and there is a need to reliably predict the behavior and better understand transition mechanisms. We use Direct Numerical Simulation to study transition induced by blowing and suction in a flat plate boundary layer flow at Mach 2.25. We use an unstructured compressible solver with a novel shock capturing scheme that is active only in regions of discontinuities. Preliminary results show good agreement with past work. We will use the simulation results to discuss the time-averaged behavior, transition mechanism, and the importance of simulation details (computational technique, domain size, mesh and timestep).

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