Abstract Submitted
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Viscous flow past wedge LING XU, University of Michigan, Ann Arbor, MI — Direct numerical simulations are applied to study viscous flow past an infinite wedge with the angle ranging from 60 to 150 degrees. The background flow is potential and increases at a fixed acceleration rate $p \in [0, 1]$. The work is focused on the dynamics of the starting vortex near the wedge tip. Results show the time evolution of the vorticity, streamlines, streaklines at varying wedge angles and acceleration rates. Since the wedge length is infinite, At early times, it is shown that solutions of different viscosity are identical upon a scale; the trajectory of the vortex core follow the inviscid similarity theory. At later times, hierarchical recirculating regions corresponding to alternating signs of vorticity appear at wedge tip. We also compare the results with experiments, and consistency and discrepancy are discussed.

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