

Abstract Submitted
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On linear instability of a flared cone at Ma 6 XI CHEN, YIDING ZHU, CUNBIAO LEE, Peking Univ — LST calculations are performed on a flared cone over Mach 6 flow. The mean flow is efficiently obtained by first calculating the inviscid flow with FLUENT to get the flow information at the edge of the boundary layer, and then solving the nonsimilar boundary layer equations with spectral collocation method. The LST solver is based on spectral collocation method (global solver) and Malik's fourth-order compact finite-difference method (local solver). The profiles and frequency band of the second mode instability from LST are in nice agreement with experimental results obtained by PIV and PCB. Three kinds of instabilities, i.e., steady and unsteady Gortler instability, first mode instability and second mode instability have been identified by a new criteria. The effect of the bulk viscosity on these instabilities is studied. At last, the inviscid linear stability analysis is performed to better understand the curvature effects on the stability.

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