

Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Linear analysis and temporal DNS of compressible mixing layers

MONA KARIMI, SHARATH GIRIMAJI, Texas A&M University — We perform linear analysis and temporal direct numerical simulations (DNS) of high-speed compressible mixing layers. The DNS solver is based on Gas Kinetic Method (GKM) and has been validated in a variety of high-speed shear flows and against rapid distortion theory results. The objective is to examine the effect of compressibility on Kelvin-Helmholtz instability. We perform modal and statistical analysis. The difference in the behavior of two-dimensional and oblique modes is investigated. The action of pressure on 2D and oblique modes is differentiated. The stabilizing influence of compressibility on mixing layer growth (quantified by the so-called Langley Curve) is investigated from fundamental principles.

Sharath Girimaji
Texas A&M University

Date submitted: 02 Aug 2012

Electronic form version 1.4