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**Stability of vortical structures of high and low speed mixing layers**

MONA KARIMI, SHARATH GIRIMAJI, Department of Aerospace Engineering, Texas A&M Engineering — It is known that mixing layers feature spanwise rollers and long streamwise vortices at low Mach numbers. At high speeds, the spanwise rollers are less evident. In this presentation, we attempt to identify the underlying instability mechanisms that ultimately lead to the growth or stabilization of different structures. Specifically, we examine the effect of Mach number and perturbation orientation on vorticity production. The nature of vortex stretching at different Mach numbers is investigated and the change in its character due to the onset dilatational velocity fluctuations is established. It is shown that the dilatational field suppresses spanwise rollers while leaving the streamwise vorticity intact.

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