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**Preliminary considerations of shock driven interfacial instability as a delta function impulse source in the transition to turbulence** ERIK VOLD, Los Alamos National Laboratory — Previous work (Vold and Tomkins) compared computations to experiments for a shock driven interfacial instability (Richtmyer-Meshkov, R-M, instability) in a shocked gas cylinder. Mixing proceeds from an initially diffuse interface to a complex dipole vortex flow, then to a secondary instability with a characteristic unstable mode scale of about one tenth the initial gas cylinder diameter, and finally to a 'fully' mixed state. We consider the impulsive source driving that fluid mixing source in the shocked system as a delta function for application to the continuous energy source driving the transition to turbulence in more general shear flow cases. The baroclinic vorticity source and resultant pressure field in the shocked case is contrasted to the vorticity source arising from the velocity profile near a wall or in free shear layer turbulent flow and to the pressure profiles seen along the surface of a cylinder in a high speed flow. Transition to turbulence in shear flows is hypothesized to follow through multiple and successive instabilities, each similar to the secondary instability transition observed in the R-M experiments, and with each instability cascading to a successfully smaller scale until molecular dissipation can accommodate the flow energy.

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