1036-76-28 **James Glimm*** (glimm@ams.sunysb.edu), Stony Brook University, Dept. of Applied Math & Statistics, Math Building Room 138A, Stony Brook, NY, **Hyun Kyung Lim** (hyulim@ams.sunysb.edu), Stony Brook University, Dept. of Applied Math & Statistics, Math Building, Stony Brook, NY 11794-3600, and **Yan Yu** (yan2000@ams.sunysb.edu), Stony Brook University, Dept. of Applied Math & Statistics Math Bldg., Room 1-104, Stony Brook, NY 11794-3600. *The Mathematics and Numerics of Chaotic Mixing Flows.*

We consider a class of flows for the compressible Euler equations in two dimensions which have strongly chaotic behavior. The flows start with a sharp interface between two fluids, and a shock wave which crosses and recrosses the interface. Numerical evidence suggests that the mathematical solution, if there is any, is a generalized solution in the sense of compensated compactness.

We present this evidence, and propose methods to solve a regularized version of the problem numercially with feasible levels of grid refinement. (Received December 07, 2007)