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Analysis of Mixing Layer LES Data with Convective Mach Number 0.9 to 1.3^1 CLARA M. HELM, M. PINO MARTIN, University of Maryland — The study of compressible mixing layers is essential to gaining a fundamental physical understanding of the global effects of compressibility on the development of turbulence in shear (Smits & Dussauge 2006). Research on compressible mixing layers is particularly difficult mainly because of the sensitivity of the mixing layer to initial conditions. A mixing layer occurs naturally in separated shock turbulent boundary layer interactions (STBLIs). We use our STBLI database to study the properties of mixing layers with convective Mach numbers of 0.9, 1.1, and 1.3. We report on the spreading rate, turbulence stress level, vortex shedding frequency, vortex convection velocity, and differences in the three-dimensional form of the vortices. The results are compared with mixing layer data available in literature and evaluated using the various scaling laws that have been proposed over the years. We discuss to what extent the mixing layer in the STBLI represents the canonical case and what additional insight into the is research area it provides.

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