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Progress on Simultaneous PLIF/PIV Measurements for a Turbulent Complex Fluid Interface DAVID REILLY, MOHAMMAD MOHAGHAR, JOHN CARTER, Georgia Institute of Technology, JACOB MCFARLAND, University of Missouri, DEVESH RANJAN, Georgia Institute of Technology — Experiments were performed at the inclined shock tube facility at Georgia Institute of Technology to study a Richtmyer-Meshkov unstable complex interface. The complex density stratification was achieved by counter flowing N_2 over CO_2 in order to create shear and buoyancy effects. The resulting Atwood number is 0.23 with an incident shock strength of Mach 1.55 and an angle of inclination of 80° . High-resolution, full-field simultaneous Planar Laser-Induced Fluorescence (PLIF) and Particle Image Velocimetry (PIV) was employed to measure density and velocity statistics, respectively. For the first time with the inclined interface, mixing parameters from the BHR (Besnard-Harlow-Rauenzahn) model, including the density self-correlation and turbulent mass flux, are determined from experiments. Secondary modes added to the interface result in markedly greater mixing compared to the simple inclined interface as measured by mixedness and mixed mass.

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