

Abstract Submitted
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High-Speed Tomographic PIV Measurements of Strain Rate Properties in Turbulent Partially-Premixed Jet Flames¹ BRUNO CORITON, JONATHAN H. FRANK, Sandia Natl Labs — The effects of combustion on the strain rate field in turbulent jets were studied using 10 kHz tomographic particle image velocimetry (TPIV). Measurements were performed in a series of turbulent partially-premixed jet flames with increasing jet Reynolds numbers and increasing probabilities of localized extinction. Properties of the strain rate were analyzed including the relative ratios of principal strain rates, the preferential alignment of the principal strain rates with vorticity, and the strain rate clustering and intermittency. Comparisons with measurements in turbulent air jets revealed the effects of heat release on the structure and dynamics of the strain rate field.

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