

Abstract Submitted
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Laser-Diagnostic Mapping of Temperature and Soot Statistics in a 2-m Diameter Turbulent Pool Fire SEAN KEARNEY, Sandia National Laboratories — We present spatial profiles of temperature and soot-volume-fraction statistics from a sooting 2-m base diameter turbulent pool fire. Dual-pump coherent anti-Stokes Raman scattering (CARS) and laser-induced incandescence (LII) are utilized to obtain profiles of temperature and soot probability density functions (pdf) at three vertical heights above the surface of the methanol/toluene fuel pool. The experiments are conducted in the unique Sandia FLAME facility, which has recently been modified to allow for vertical translation of the optical systems and horizontal translation of the liquid fuel burner. Results are presented both in the fuel vapor-dome region at 0.25 base diameter and in the actively burning region at 0.5 and 0.75 diameters above the fuel surface. The evolution of the soot and temperature pdfs is discussed, profiles of the temperature and soot mean and rms statistics are provided, and initial estimates of the joint temperature/soot statistics, which describe soot radiative emission, are presented.

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