LASER-BASED TECHNIQUES FOR TEMPERATURE AND SPECIES MEASUREMENTS

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ABSTRACT Highly advanced measuring techniques in turbulent reacting flow measurements are based on lasers. The special characteristics of lasers have attracted many diagnosticians to develop new powerful measuring techniques for flow velocity, temperature and species concentrations in reacting flows. In addition laser techniques have been developed for soot measurements. Laser techniques offer high spatial and temporal resolution and are applicable to single point, line, two-dimensional and three-dimensional measurements. Laser-based measurements have a great contribution in understanding the structure of reacting flows during the last few decades.

This lecture provides a brief review of the most advanced and powerful laser techniques for reacting flow measurements. Raman scattering, Laser Induced Fluorescence (LIF), Laser Induced Incandescence (LII) and Coherent Anti-Stokes Raman Spectroscopy (CARS) are among the most successful techniques for combustion measurements. Applications and limitations of these techniques are discussed in this lecture.