

Flame Interaction within a Vortex

Combustion processes in real world applications, such as motors and engines, typically involve turbulent flow patterns and complex reaction chemistries in high and lower temperature flames. The lab of Prof. Yiguang Ju from Princeton University just reported on experiments measuring the behavior of flames interacting with a vortex (simulating turbulence). One of the research goals of the Ju lab is the exploration and development of new knowledge and techniques to advance new and cleaner combustion techniques. Moreover, the lab has been experts in creating cool diffusion flames and investigating turbulent combustion processes.

The lab created double - cool and hot - flame and observed as the flame interacts with a flow vortex. The researchers use a planar laser induced fluorescence technique (PLIF). A pulsed laser beam is expanded into a two-dimensional sheet of light that is sent through the flame. The fluorescence signal is measured with a gated PI-MAX4 ICCD camera. PLIF allows to target specific molecule species and results in a two-dimensional fluorescence image. Besides high temporal and spatial resolution PLIF allows researchers to measure molecule concentrations, distributions and velocities as well.

Featured Paper/Publication: [Transient interactions between a premixed double flame and a vortex,](#)
Proceedings of the Combustion Institute, 2018

Reference Lab: [Yiguang Ju and team, Princeton University, USA](#)

Featured Product: [PI-MAX4](#)