2. Visualization Using Reactive Mie Scattering for Buoyant Diffusion Flames

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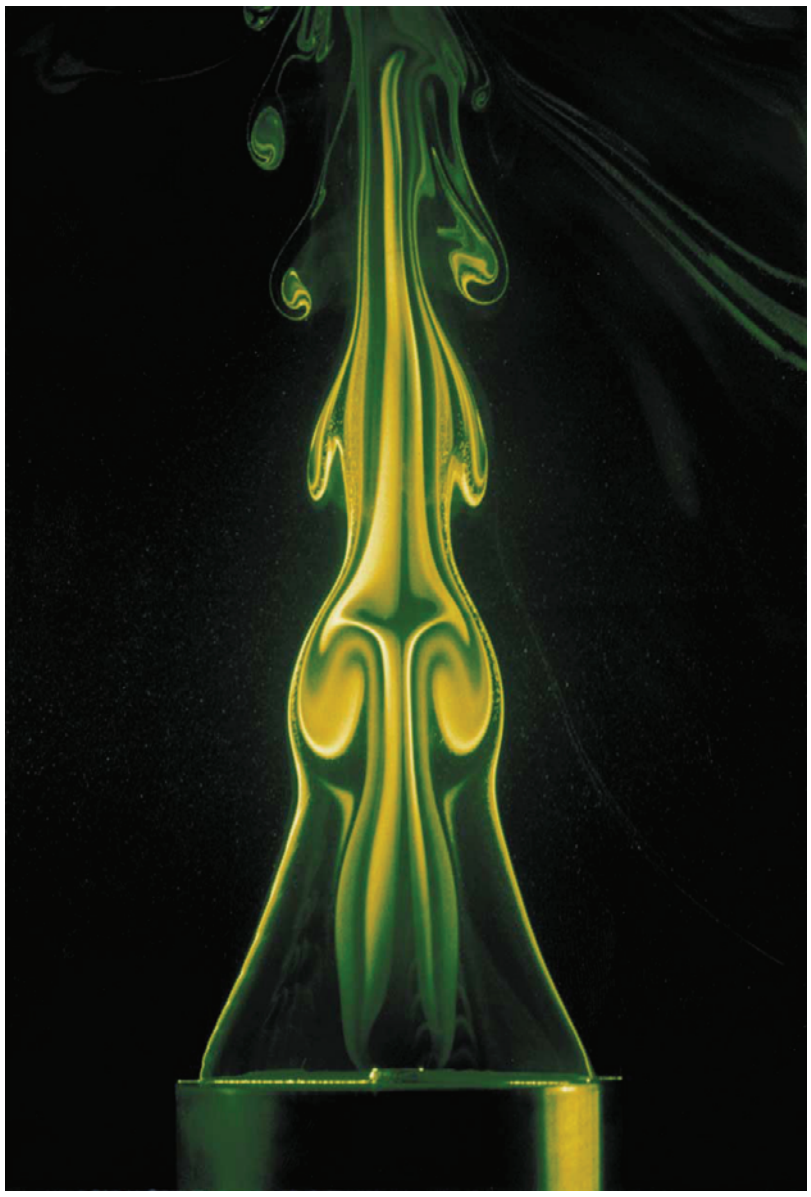

The photograph shows oscillating laminar diffusion flame in a co-flow burner due to buoyancy driven instability. Reactive Mie scattering (RMS) technique with the sheet beam from a Nd:YAG laser visualizes the flame structure. Propane and dry air were supplied through an inner tube (i.d. 10.6 mm, 10 cm/s) and outer tube (i.d. 101 mm, 7 cm/s), respectively. Small amount of $TiCl_4$ vapor is added to dry air to produce TiO_2 particles by the reaction of $TiCl_4$ with either water vapor existed in the ambient air (outer most traces) or water vapor formed in a flame. The inner most traces are due to the scattering from soot particles.