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Combustion-related answers from and questions for photon tools

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Combustion chemistry plays an increasing role in several respects. New combustion regimes are associated with previously unrecognized chemistry, and alternative fuels may have different fuel-dependent reaction pathways. In both contexts, photon tools are of significant importance. They offer the means to probe the reactants directly.
This widely accepted statement might be regarded with a spirit for discussion. Is what we can measure the information that we should know? Several options exist to employ photons for combustion (chemistry) diagnostics. Lasers are indispensable to analyze practical systems, with limited chemical insight, however. Chemiluminescence seems attractive for combustion control, again offering some specific chemical information. Photo-ionization in combination with mass spectrometry techniques is a most powerful current tool to provide experimental information for model development and validation, but with application ranges often quite different from those in applied systems.
With examples from our own experience, collaborative results and recently published work by others, the talk intends to stimulate responses for opportunities where combustion-related questions might be addressed by photon tools.

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