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Investigation of ignition dynamics in a mixing layer with a vortex SHYAM MENON, GUILLAUME BLANQUART, California Institute of Technology — Numerical simulations are developed to study ignition dynamics in a non-premixed H₂/air layer where mixing is aided by an embedded vortex. A similar reacting flow situation is encountered in many practical devices including internal combustion engines and supersonic combustion. The current work improves upon previous work by using tabulated chemistry to predict ignition dynamics, greatly reducing the computational requirements. The key results include the prediction of ignition delay time as a function of hot air temperature and vortex characteristics such as vortex strength, characteristic size and center location. The simulations will be used to explore different regimes of ignition previously observed by varying vortex Reynolds numbers and oxidizer temperatures.

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