Laminar Burning Velocity in Hydrogen-Oxygen-Nitrogen Mixtures

Master's thesis number: FMH606

Introduction and background:

One way of mitigating hydrogen explosions in confined space is to reduce the oxygen concentration in the cloud. (i.e., reducing the O2 concentration in the confined) and thereby reduce the heat release and laminar burning velocity of the premixed gas. This study aims to find the burning velocity in hydrogen-oxygen-nitrogen mixtures by performing experiments in a 20-liter explosion vessel.

Task description and objective:

- To perform a literature study on laminar burning velocity in hydrogen-oxygen-nitrogen mixtures.
- To use Cantera to simulate laminar burning velocity in hydrogen-oxygen-nitrogen mixtures.
- To do experiments with a 20-liter explosion vessel with hydrogen-oxygen-nitrogen mixtures.
- To find laminar flame speeds in hydrogen-oxygen-nitrogen mixtures from high-speed videos.
- To compare predicted and measured laminar burning velocities.

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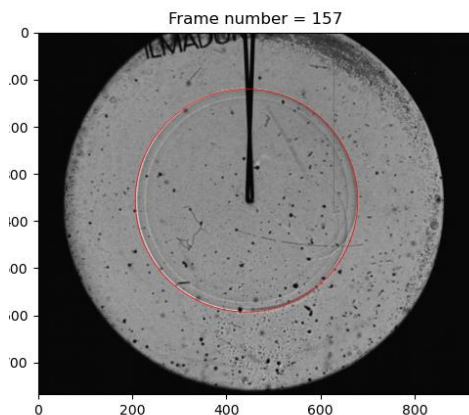
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