

Abstract Submitted  
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**Visualization of a cryogenic jet simulating leak from a liquid hydrogen storage tank**<sup>1</sup> TIM ROSE, AJAY AGRAWAL, University of Alabama — Hydrogen is considered an alternative fuel in propulsion and power generation due to fuel economy standards and environmental pollution. However, if an accidental leak were to occur in a hydrogen storage tank, the discharged fuel could find an ignition source and produce an explosion. A barrier wall can be used to contain the leak from the storage tank, therefore protecting equipment and people from the explosion. Past studies have investigated the jet/barrier wall interaction, in a laboratory setting, with fuel stored as a gas. Hydrogen fuel stored as a liquid offers higher energy density. In this work, we have studied the leak at cryogenic conditions due to liquid storage parameters. Jet fluid structure is visualized in a laboratory setting using helium as the supersonic jet fluid. High-speed rainbow schlieren deflectionometry (RSD) images are used to show instantaneous flow structure of jet (leakage point) and barrier wall interactions. Results show the jet inlet temperature leads to significant differences in the spread angle and the extent of fuel-air mixture region adjacent to the barrier wall.

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Amy Lang  
University of Alabama

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