Hypervelocity Impact of Composite Overwrapped Pressure Vessel (COPV) and Comparison to a Numerical Model

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Objectives

- Expose COPV to hypervelocity impact (HVI) testing in pressurized and unpressurized condition.
- Assess overall COPV damage incurred by HVI.
- Identify impact conditions likely to result in catastrophic rupture.
- Broaden the conclusions made from experiment by numerical analysis.

Model

- CAD model based on CT scan

Experiments and Modeling Results

- Experiments demonstrate COPV has capacity to withstand hypervelocity impact.
- Failure mode appears to be related to impact energy.
- A numerical model was designed to broaden the scope of this effort.
- Pressurizing of COPV in numerical impact simulations will be the next effort.

References


Conclusions

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- Failure mode appears to be related to impact energy.
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