



UNSW
SYDNEY



Hypersonic Aerodynamics

Reducing the risk of high-speed flight testing and development through the application of scaled, dynamic free-flight testing in wind tunnels.

Competitive advantage

- Pioneering the use of highly-instrumented, low-inertia, dynamically-scaled, rapidly-prototyped, models with on-board instrumentation for free-flight testing in hypersonic conditions in ground-based test facilities
- Measurement of the aerodynamic derivatives of a design across a range of attitudes in a single experimental run using a unique combination of on-board instrumentation, including miniature inertial measurement units, in tandem with high-speed video tracking. This technique offers the unique ability to quickly validate numerically-derived aerodynamic databases using a small number of wind tunnel experiments
- Ability to investigate high-speed separations including multi-stage separation and stores release and to quantify the associated multi-body aerodynamics

Impact

- Tunnel-based, free-flight testing helps to reduce the requirement and risks associated with expensive flight testing of high-speed vehicle designs and configurations. Tunnel-based free-flight testing allows for assessing the accuracy of numerical designs and identifying unforeseen issues using ground-based test facilities. Changes to geometric design, mass distribution and separation approach can be rapidly asse

More Information

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