LIBRA Project

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Purpose

LIBRA hopes to prove the failure of control surfaces at stall and to implement a novel augmented rolling system invented using the Lie Bracket. This mechanism will enhance control authority at high angles of attack and during turbulent flow.

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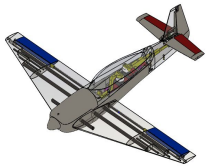
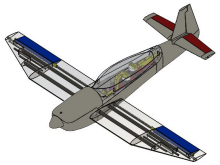
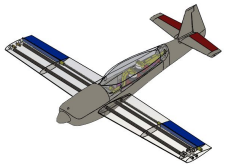
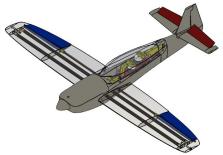
Ananth Krishnan
Friedrich Zurawka
Gokul Varma

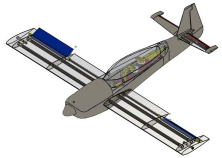
Marc Galobardes
Mariam McCloskey
Nicholas Comingo
Ron Cabuang
Shubham Sharma







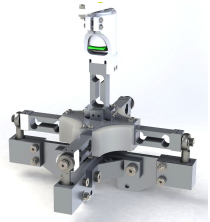




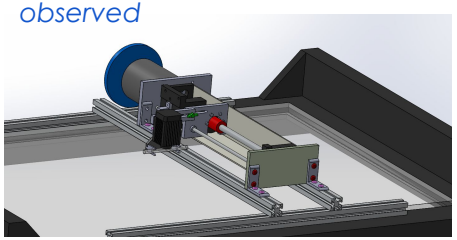
The 5 plane models are designed with 5 different wing shapes, while maintaining the same area

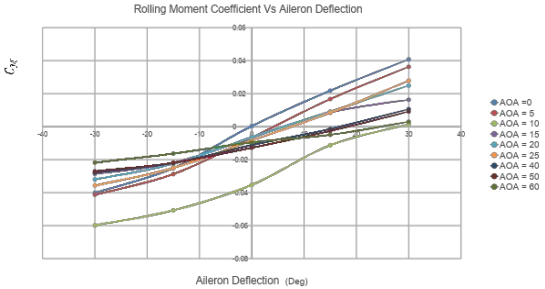
The LIBRA Mechanism will oscillate the ailerons and the elevators with a phase shift at high frequencies. This will theoretically product a powerful rolling moment.

A multi-axis load cell was designed to measure the aerodynamic forces and moments in the wind tunnel at different AOA.



This system casts a laser field over the aircraft models so the air flow around the wings can be observed





Rolling Moment – AOA Curve with zero Aileron Deflection