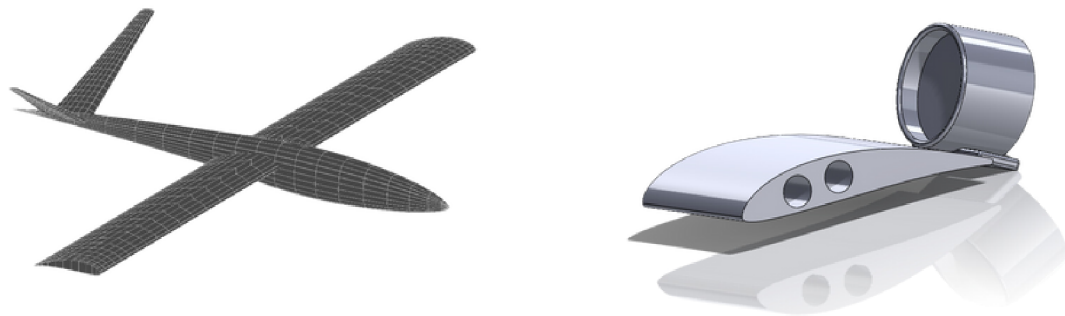


Urban Zero-Emission Aerial Transportation: Design and Analysis of a Short-Takeoff-andLanding UAV Based on Tilted Boundary Layer Ingestions Engines

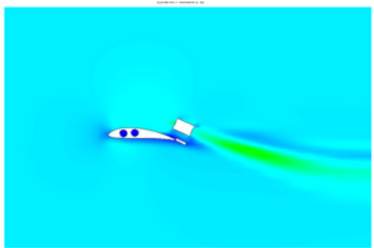
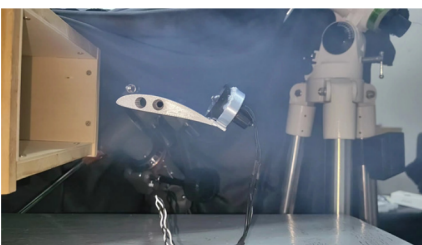
Hanyue Shen, Ningzi Chen; Shanghai Pinghe School, Chongqing Yucai Middle School; PRC

Quat I: Research Question

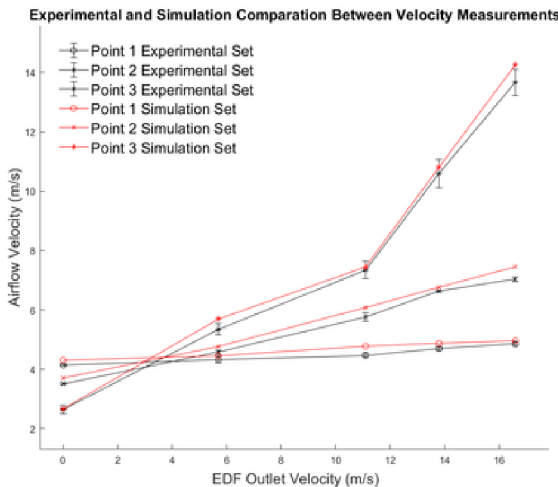


How can tilted electric boundary layer ingestion technology improve efficiency of cargo UAVs to reduce carbon emission from branch line logistics by road?

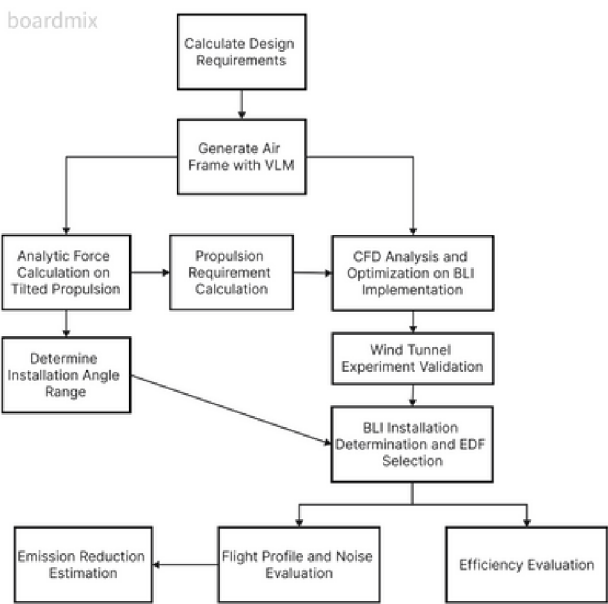
Quat III: Data Analysis and Results



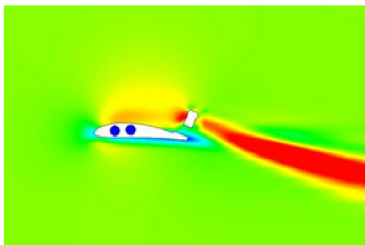
- +16.09% Aerodynamic Efficiency
- +13.90% Cruise Energy Conservation
- +9.40% Ascending Efficiency
- 3.90% Variance with Experimental Data



Quat II: Methodology



- Analytic deductions;
- Vortex-Lattice Method;
- Finite Element Analysis;
- Wind Tunnel Experiment.



Quat IV: Interpretation and Conclusions

Factor	Improvement
Aerodynamic Efficiency	+16.09% (BLI)
Energy Efficiency	+9.40% (Ascending)
Propulsion Conservation	13.90% (Cruise)_
Noise Level	~ -30dBA

- High performance;
- Efficient aerodynamics;
- Reliable and robust propulsion.

- Tilted BLI conserves energy and increase efficiency.
- Can satisfy flight requirements.
- Can reduce 1946 tons of carbon emissions per month per branch line logistic center.