

HYBRID LAUNCHING ROCKET

Anas Mahjoob (ME) - Muath Alharthi (ME) - Ayman Fatani (AE) - Ismail Ghazzawi (AE) - Suhaib Halawani (CHE) - Saleh Alzahrani (CHE)
Coach : Bilal Ahmed Qureshi



3

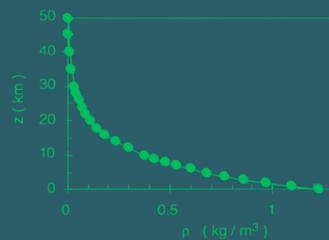


Background

A hybrid rocket system optimizes performance by starting the rocket engines at **higher altitudes**, where air density is low, instead of launching it from the ground. The system uses **propellers**, for the initial ascent to the desired altitude. This enhances **fuel efficiency**, reduces environmental impact, and optimizes ascent trajectories for sustainable and versatile functions

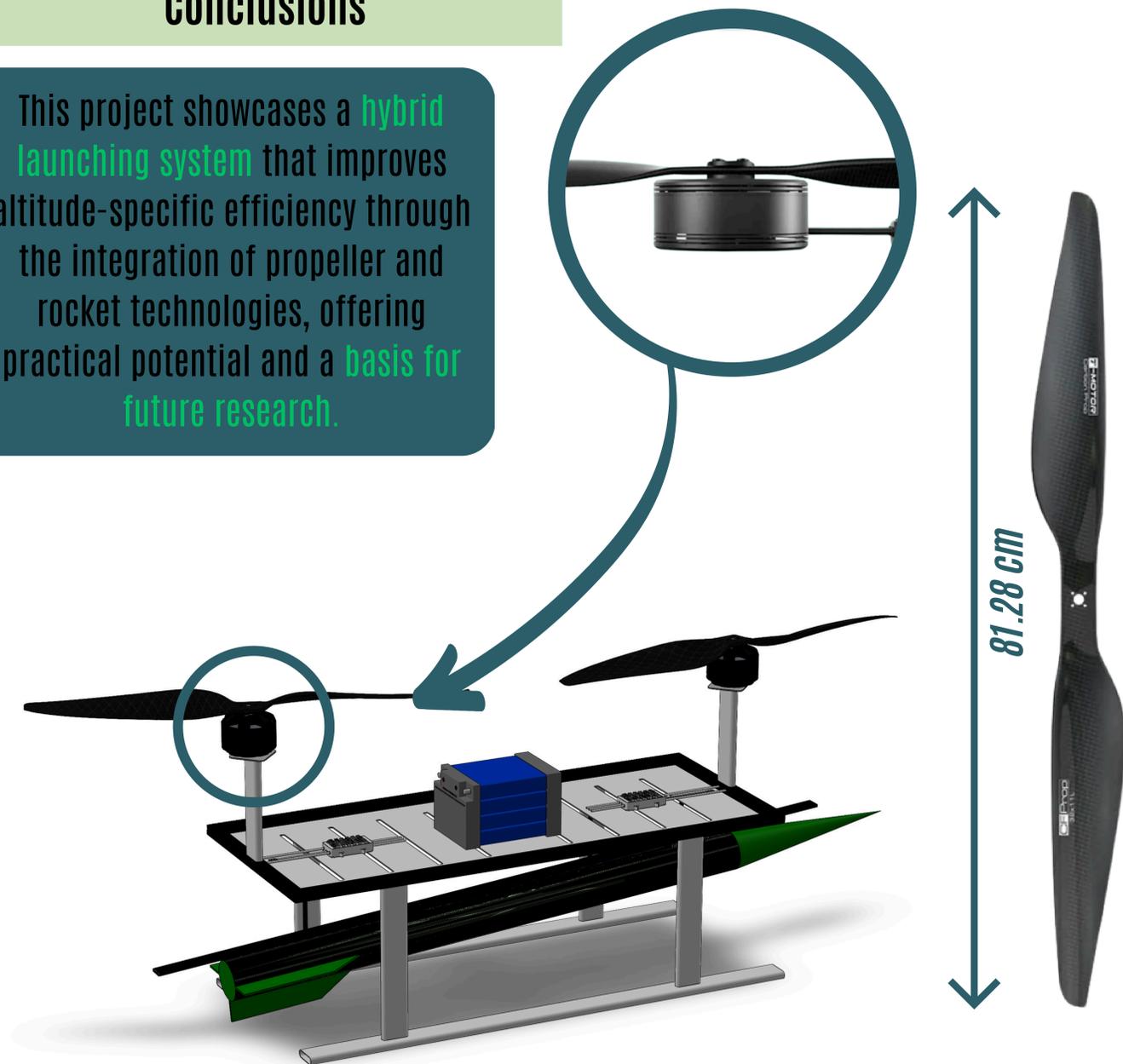
Testing / Validation

1. Propeller thrust more than **20-kilogram force** (more than 196 N) per motor
2. Specific impulse more than **100 seconds**
3. Transition time less than **15 seconds**
4. Payload capacity minimum of **2 kilograms**
5. Burning rate (Reaction rate) more than **1.5 mm/s**
6. Battery capacity more than **15 Ah**
7. Minimum detachment altitude **1.5 kilometers**
8. CO₂ Footprint less than **45-gram CO₂/kilogram of fuel**
9. Efficiency of Fuel more than **30%**
10. Maximum of Total Mass **20 kg**



Conclusions

This project showcases a **hybrid launching system** that improves altitude-specific efficiency through the integration of propeller and rocket technologies, offering practical potential and a **basis for future research.**



Hybrid Rocket System cuts fuel use by 30%!!