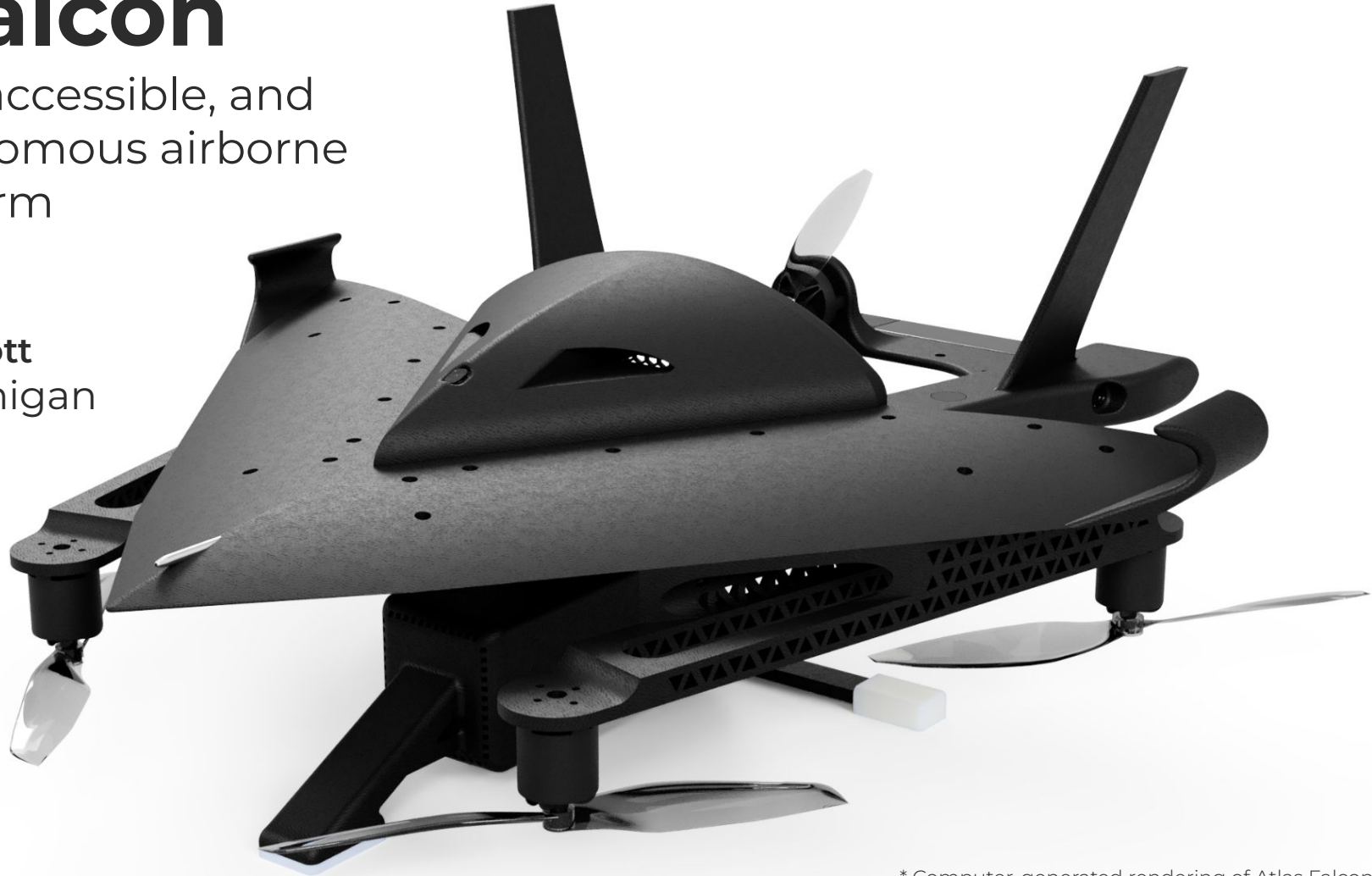


Atlas Falcon

An affordable, accessible, and modular autonomous airborne research platform

Adam Drihany
Kimberlee J. Kearfott
University of Michigan



* Computer-generated rendering of Atlas Falcon.



Democratizing Radiation Mapping

Expensive
High cost
of entry

Proprietary
Limited
flexibility

Complex
Difficult to
deploy

How can we make airborne
radiation mapping **more
accessible?**

Core design requirements



Affordable

Lower cost of entry

Flexible

Modular payload support

Reproducible

Desktop-manufacturable

Atlas Falcon overview



Blended-wing body

1.5 L internal volume
Up to 1 kg payload

49 × 50 cm

Transportable
design



46 min endurance

40 km estimated
range

2.5 kg flight mass

Carbon-fiber
reinforced nylon

Hybrid VTOL

Vertical takeoff & landing



Platform features

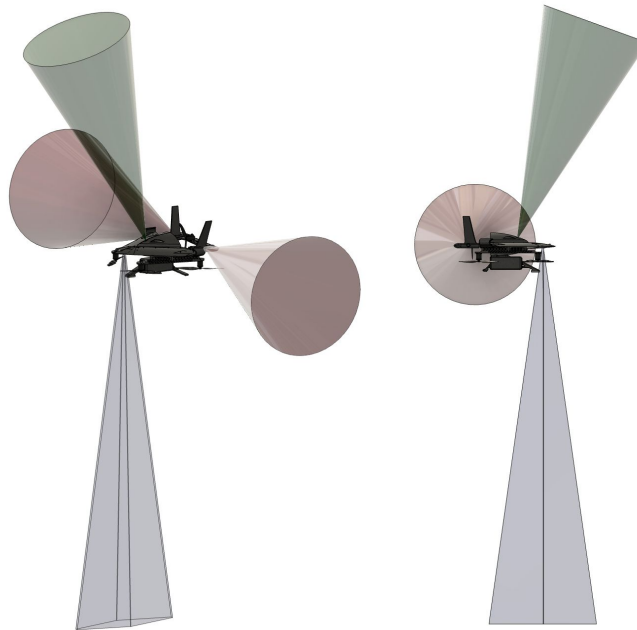


Passive cooling

Propeller-driven airflow removes heat without dedicated cooling hardware

Environmental awareness

LiDAR and ToF sensors provide multi-directional obstacle awareness



Modular architecture

Components slide into place for rapid assembly and replacement

Manufacturability

30

printed components

90

hours unattended printing

50

hours of assembly

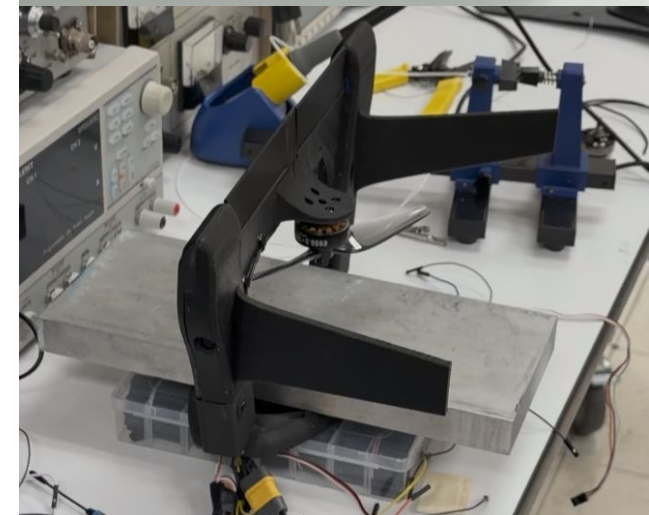
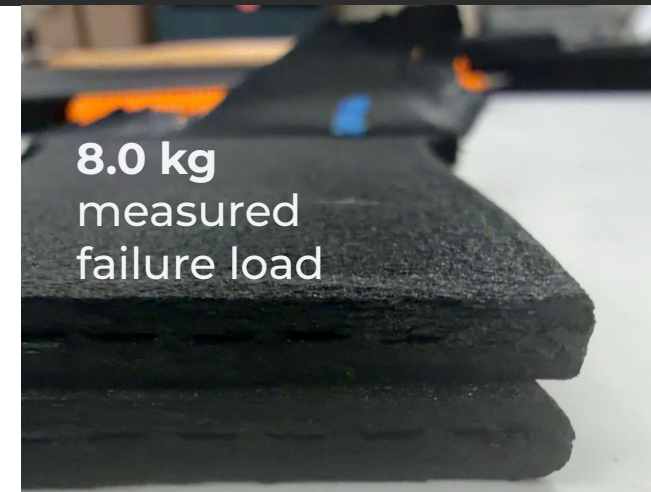
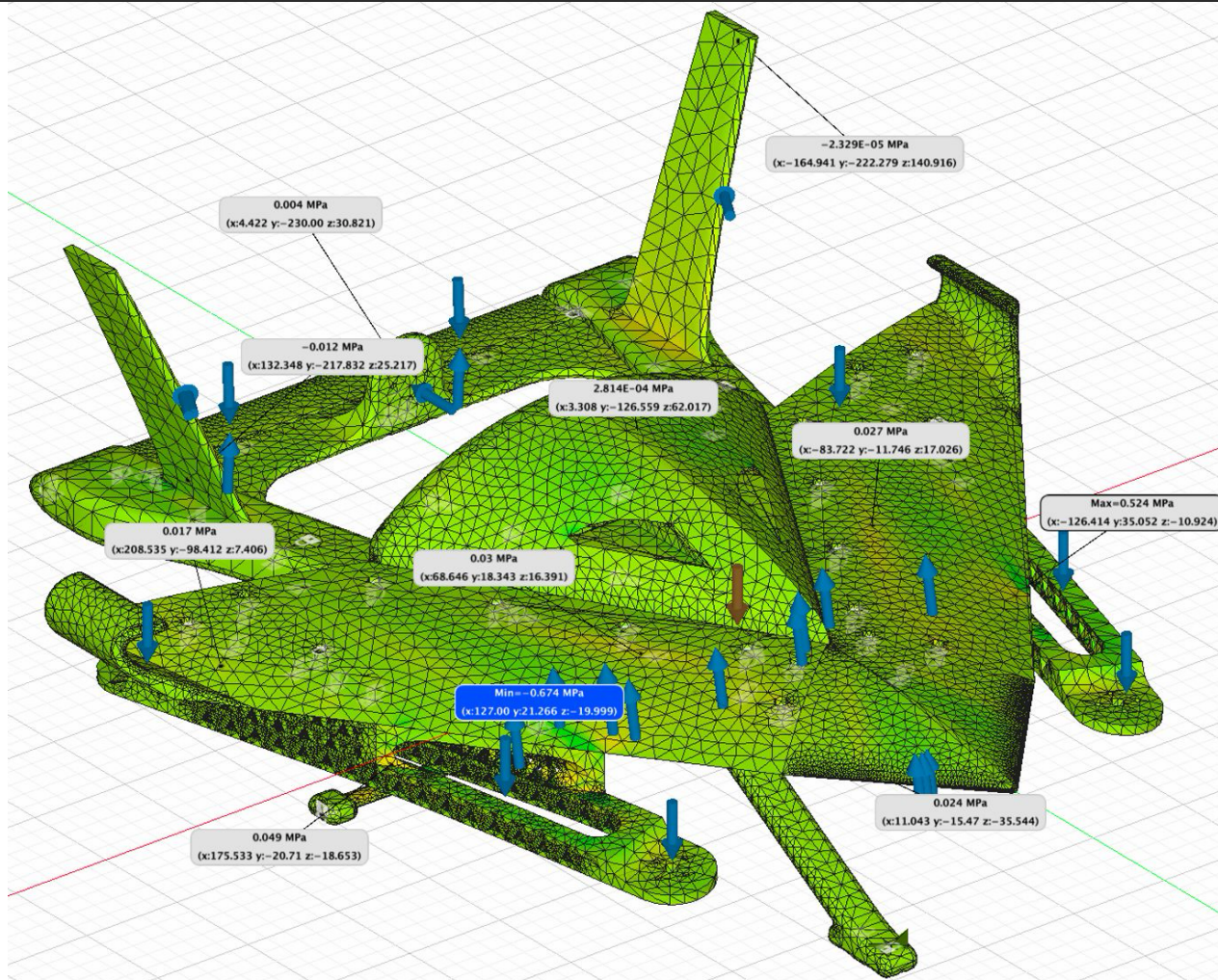
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specialized tooling or molds required¹

¹ Desktop 3D printer and basic soldering skills are needed

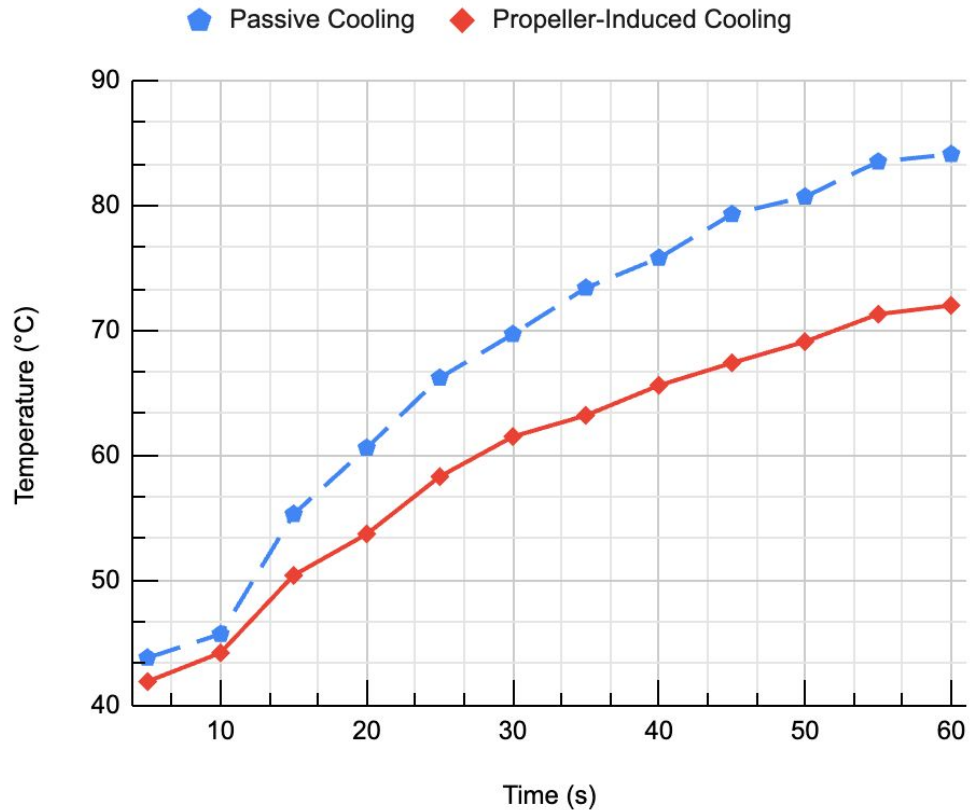


Structural validation

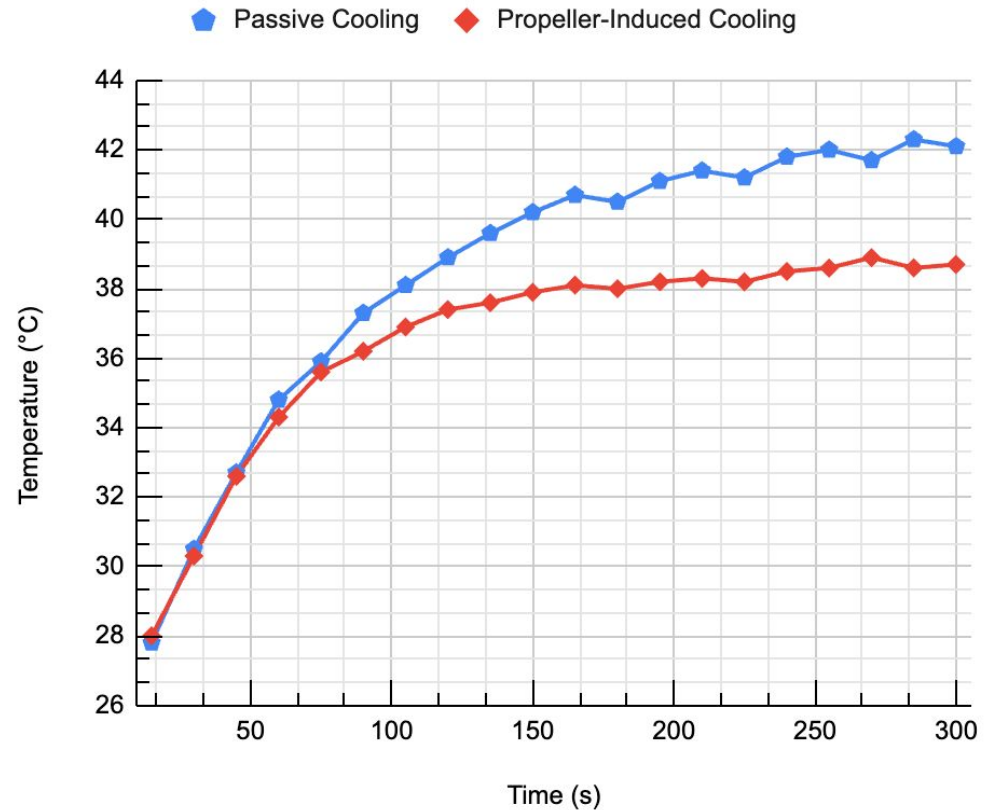


Thermal validation

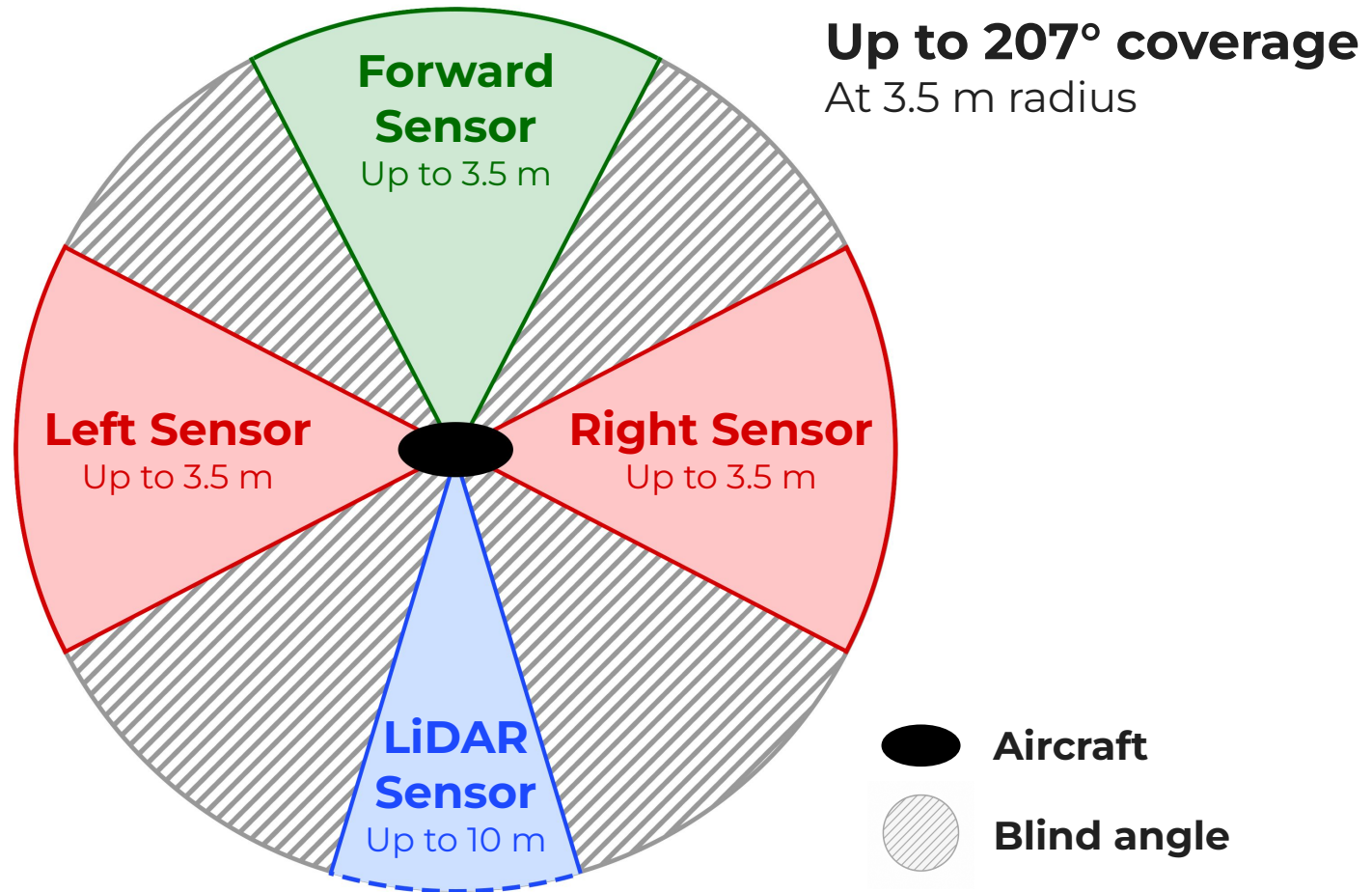
**Raspberry Pi Temperature vs. Time:
Passive vs. Propeller-Induced Cooling**



**Inferred Battery Temperature vs. Time:
Passive vs. Propeller-Induced Cooling**

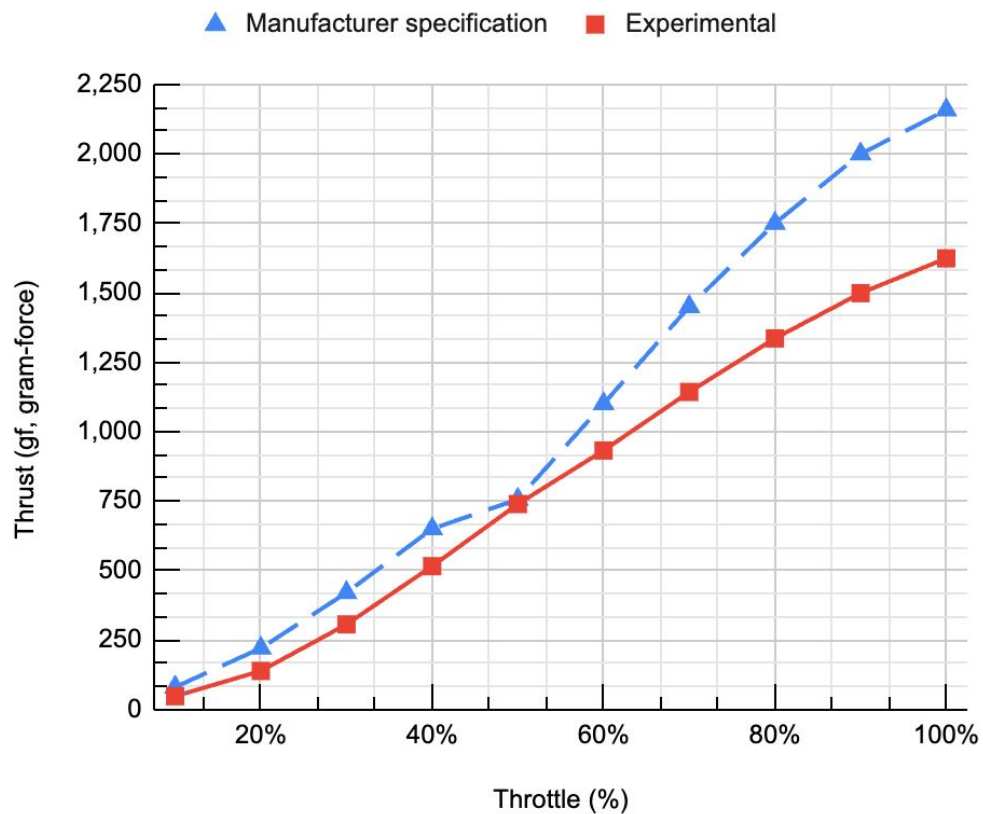


Sensing validation

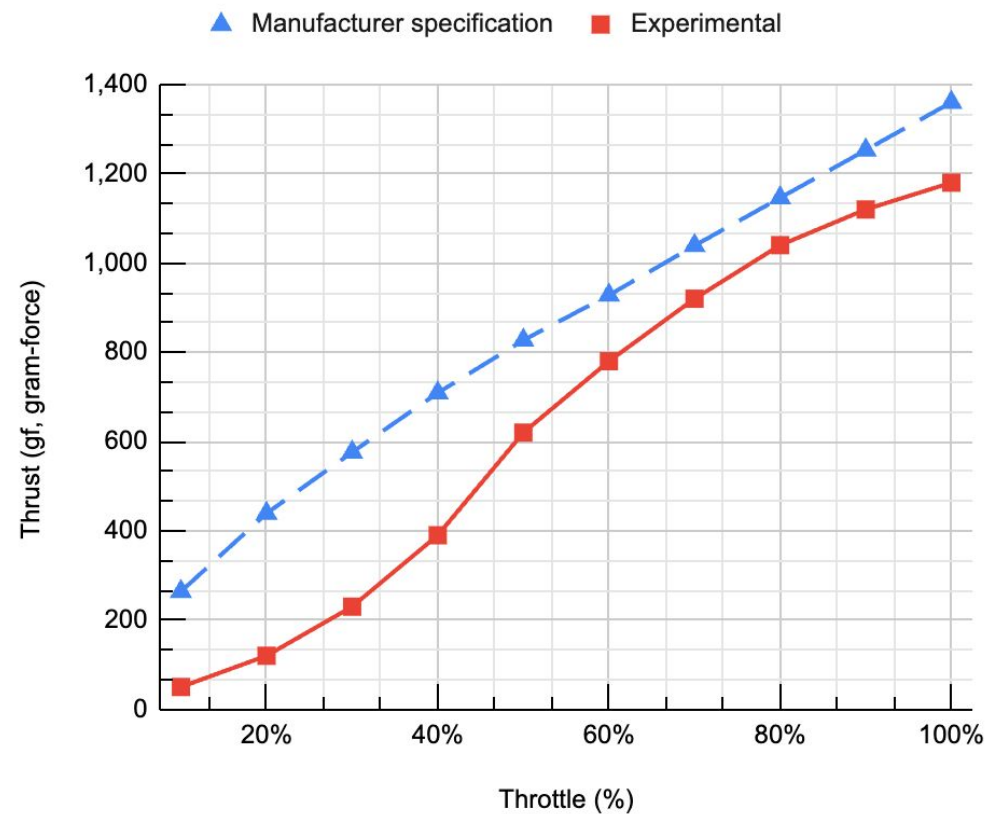


Flight validation

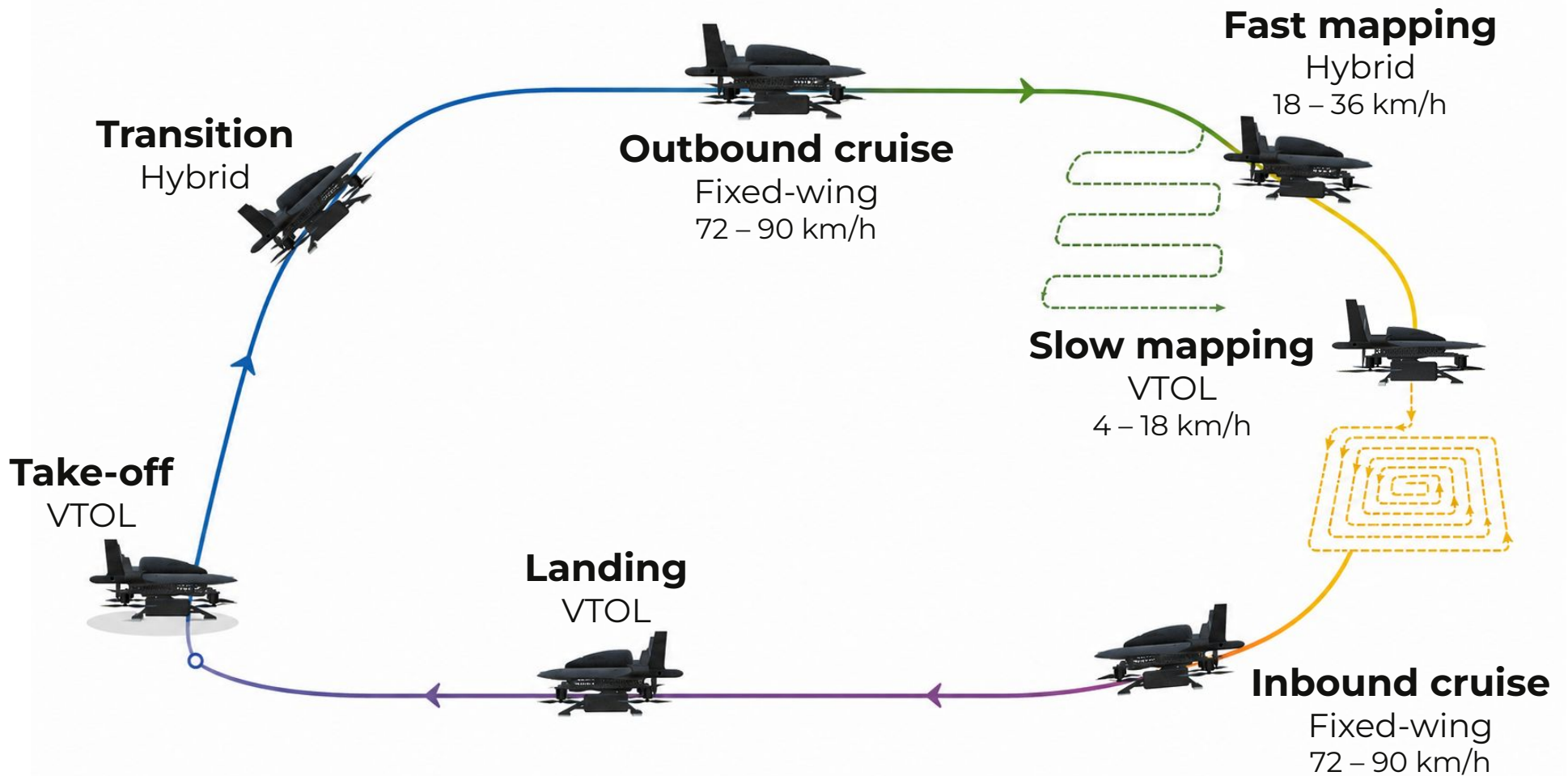
Cruise Propulsion: Experimental vs. Nominal Thrust at 14.8 V



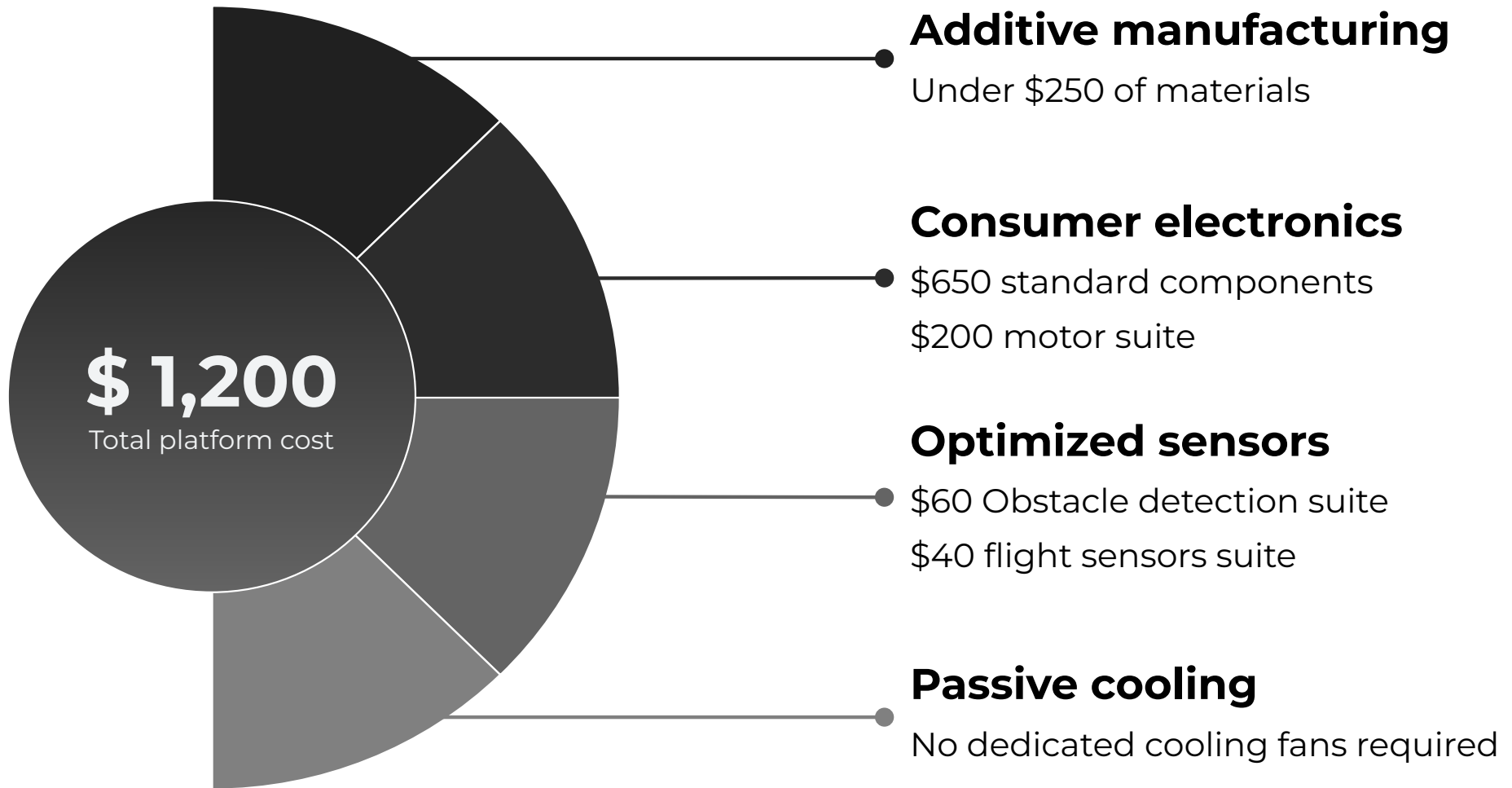
Vertical Thrust: Experimental vs. Nominal Thrust at 14.8 V



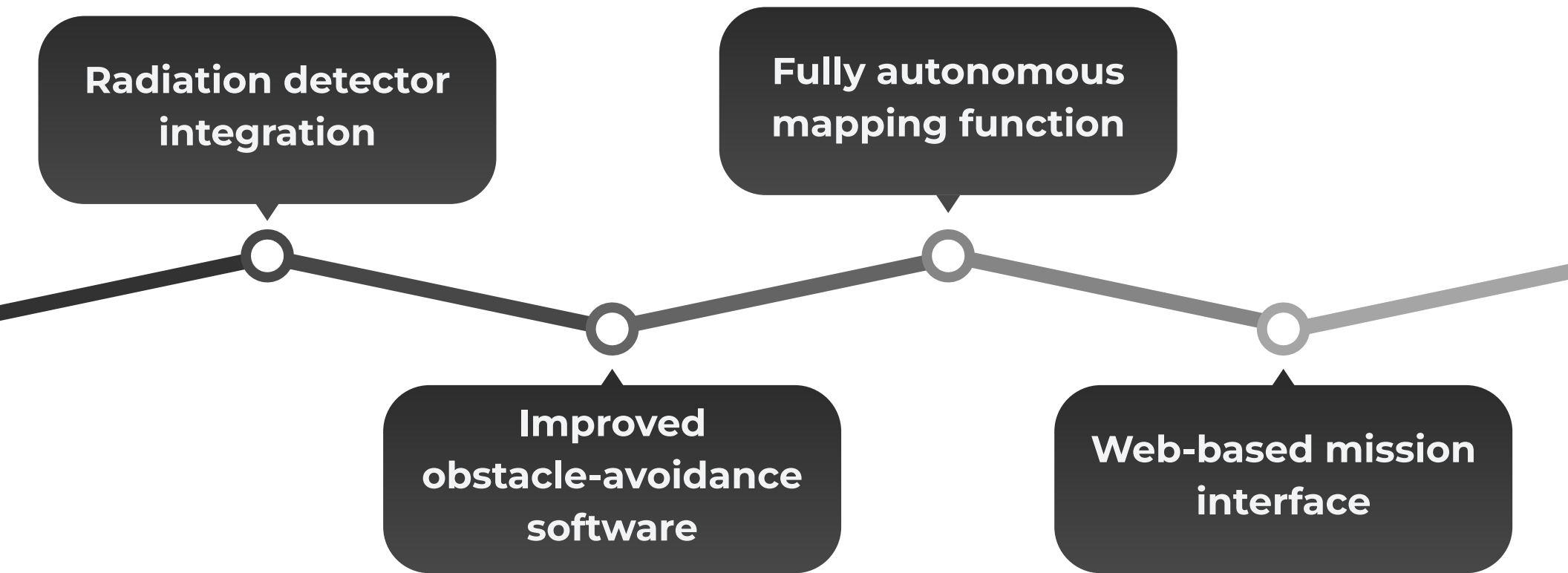
Mission profile



Platform cost breakdown



Future work



Conclusion

1

Low-cost research platform

2

Accessible architecture to new researchers

3

Fully 3D-printed and reproducible

4

Successfully manufactured, assembled, and flight tested

Democratizing Airborne
Sensing and Radiation
Mapping Research



Thank you for your attention!
Any questions?

