

Studying Radiation in Upper Atmosphere

Adam Fuge, Elvis Garcia, Marquis Muza, Nathaniel Okafor, Ethan Pierson, Rafael Sanchez

Mentor: Dr. Eddie Ong, Mr. Ernest Villicana

Phoenix College ASCEND! Team

Overview: Phoenix College's efforts for this launch are focused on refining our payload design while studying radiation and other characteristics of the upper atmosphere. To that end, we've utilized a Geiger counter and neutron counter in addition to orientation, pressure, temperature, and UV sensors.

Project Description:

The Phoenix College ASCEND! Team has had several successful launches with our carbon fiber payload. This semester we further improved our payload by implementing an improved chassis and a central battery pack.

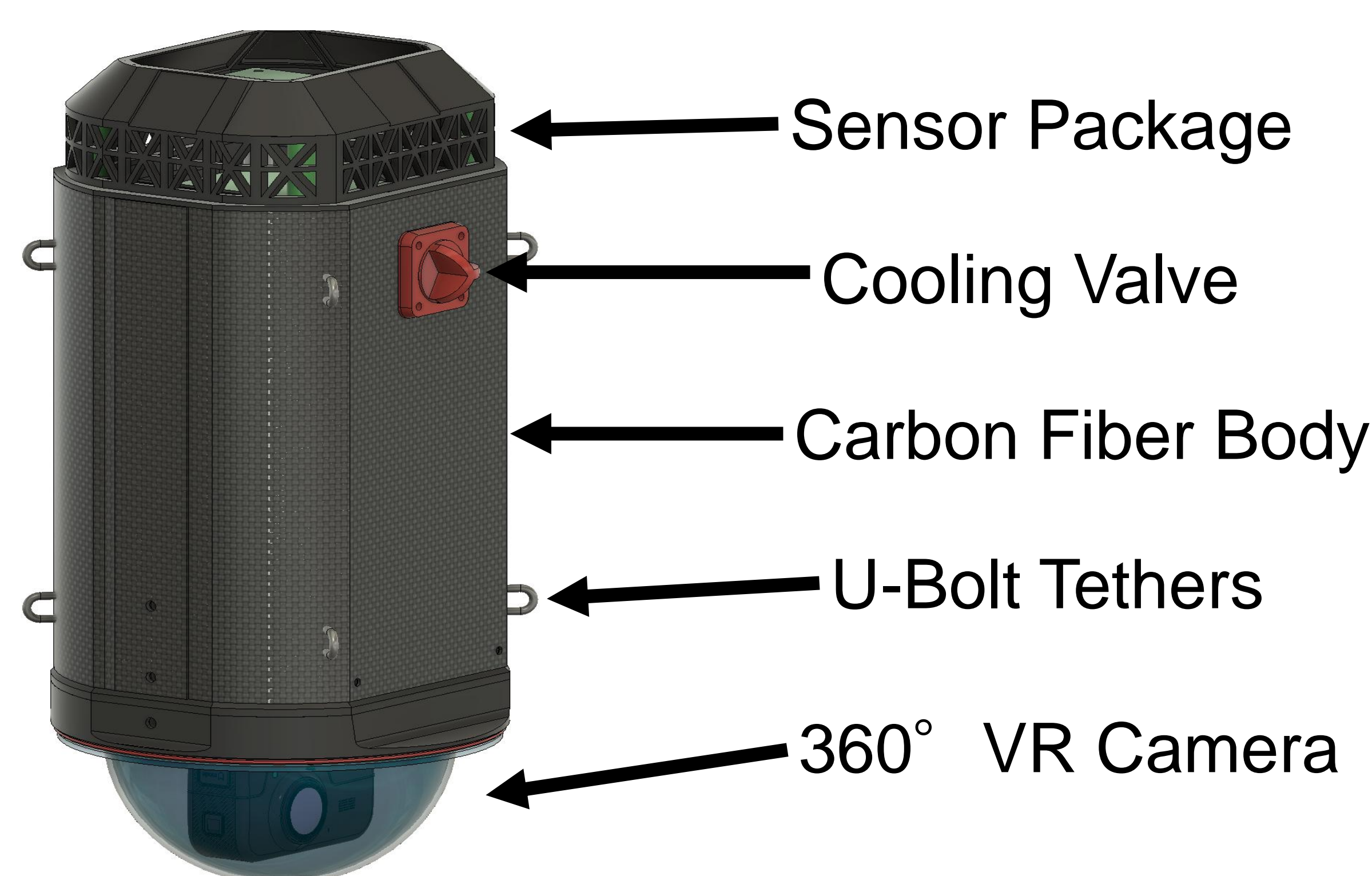


Fig. 1: Render of current payload

Results:

Our chassis redesign yielded good results, shaving weight by 40% compared to our previous chassis and maintaining structural integrity. Our neutron counter, Geiger counter, Arduino and various sensors recorded several types of atmospheric data.

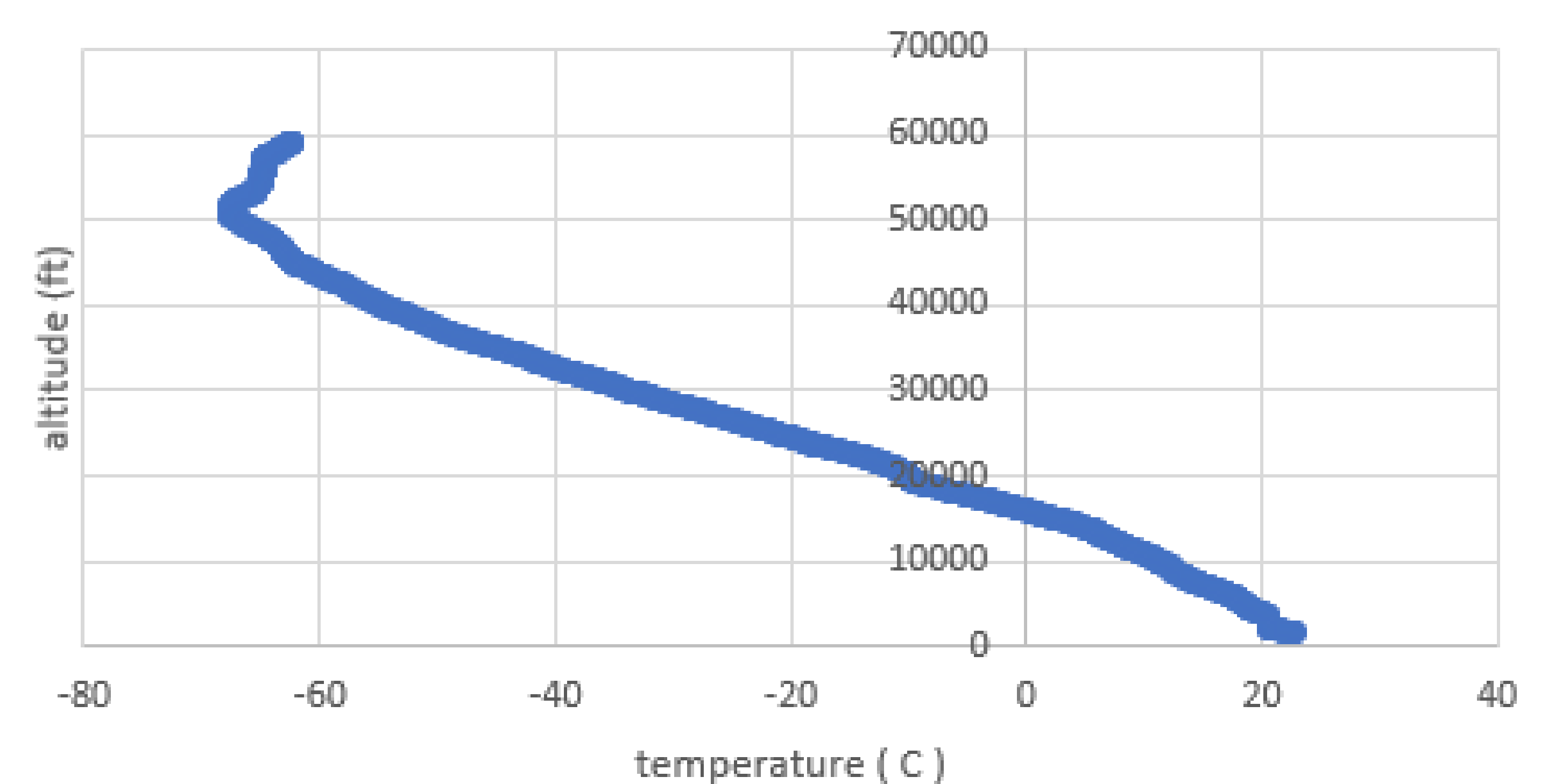


Fig. 4: Graph of Temperature vs Altitude, data was cut off at 60000 feet

Methods:

Our data was collected via our Geiger counter, neutron counter, and a PCB with our Arduino and sensors attached. Both the Arduino and VR Camera were powered via a central battery pack.

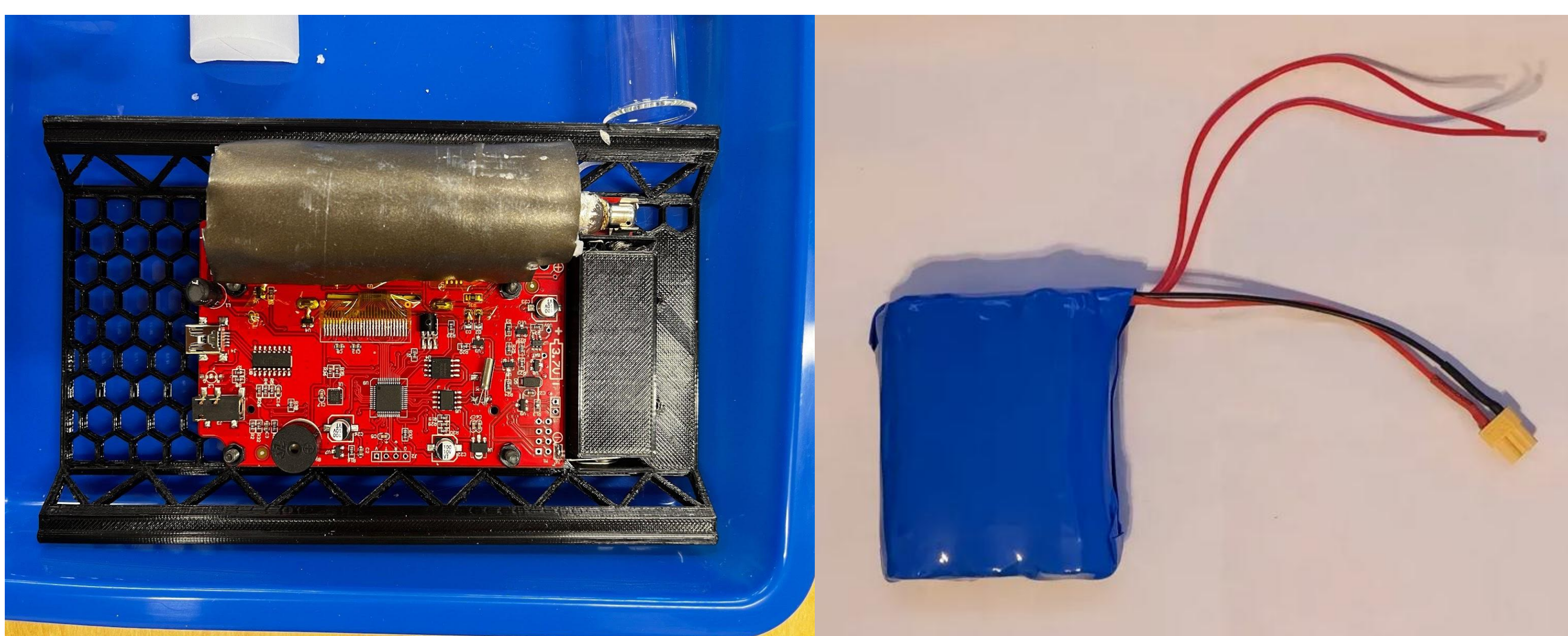


Fig. 2 (left): Neutron Counter

Fig. 3 (right): Custom built central battery pack

Conclusion:

The data obtained will help us better understand the Earth's atmosphere. This experience also helped us build our design and fabrication skills. We hope to continue refining our payload in future semesters

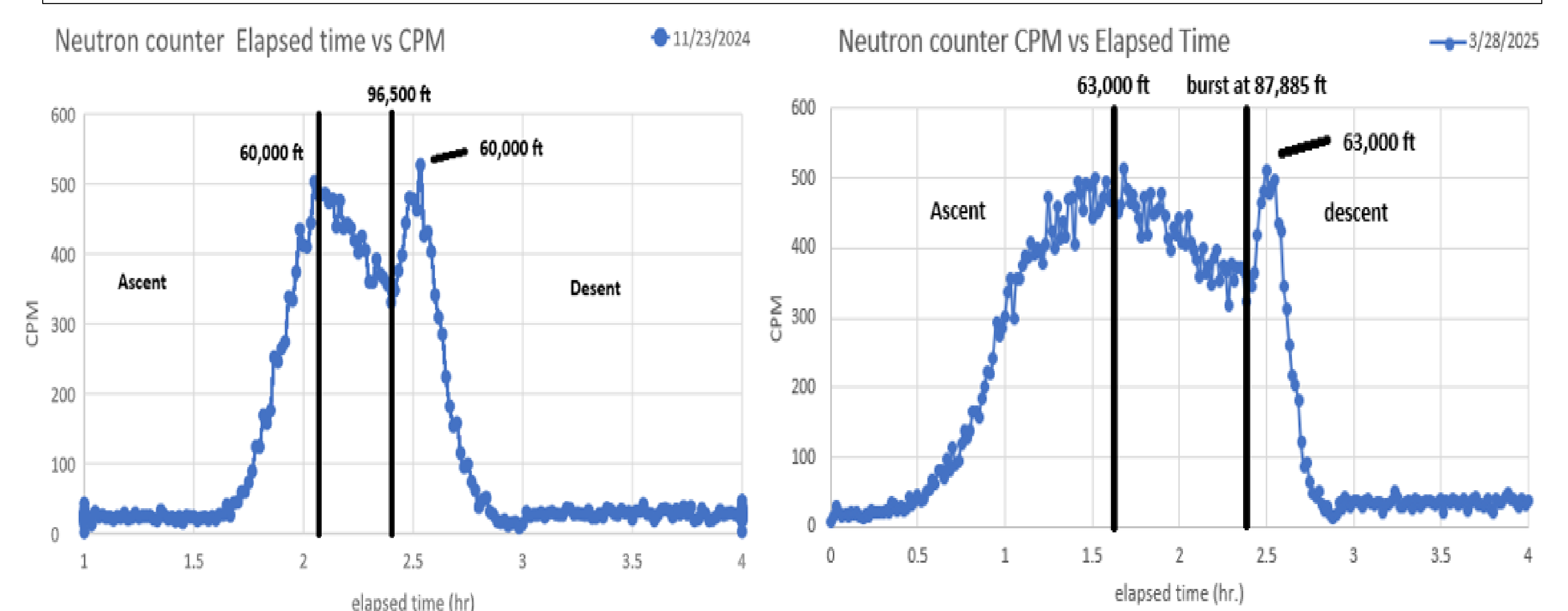


Fig. 5 (left): Graph of neutron detector counts per minute (CPM) recorded from our Fall 2024 launch

Fig. 6 (right): Graph of neutron detector CPM Spring 2025

Future Projects: We are currently considering an experiment that involves attaching several different propeller designs to our payload to determine which design is most effective at various atmospheric conditions.

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