



CoolerSat: A Modular Prototype for High-Altitude Balloon Testing of Satellite Subsystems

Get Away Special Microgravity Research Team
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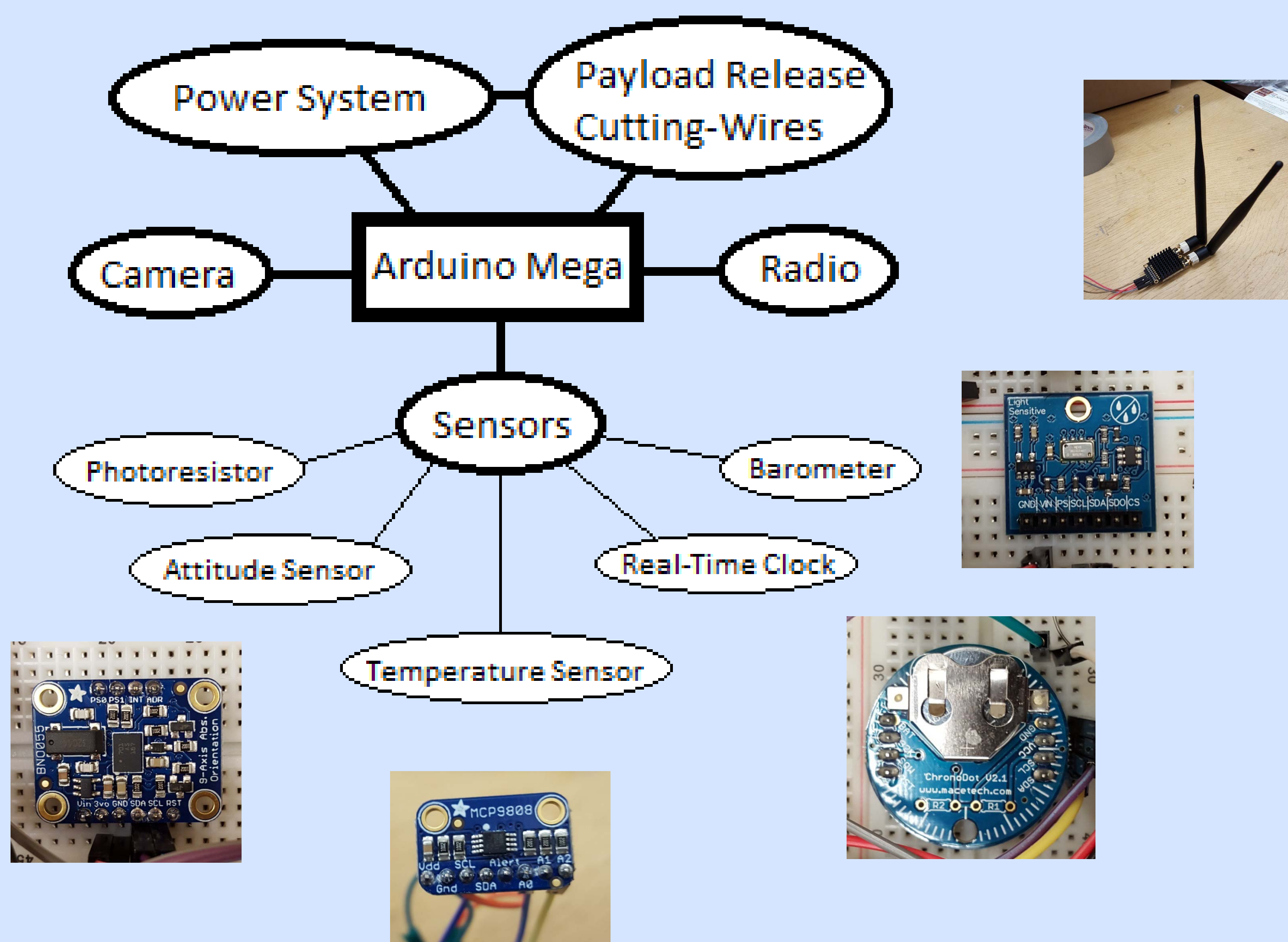


Abstract

The CoolerSat is a prototype intended to introduce new team members to the team structure, and to give the team experience as we move toward high-altitude balloon testing of components and subsystems in the summer. These components will eventually be flown on a mission to low earth orbit on a 1-U CubeSat.

System Design

The CoolerSat system was designed to include many of the systems we plan to test this summer on high-altitude balloon flights.



Acknowledgements

USU GAS Team
 Dr. Jan Sojka
 Don Rice

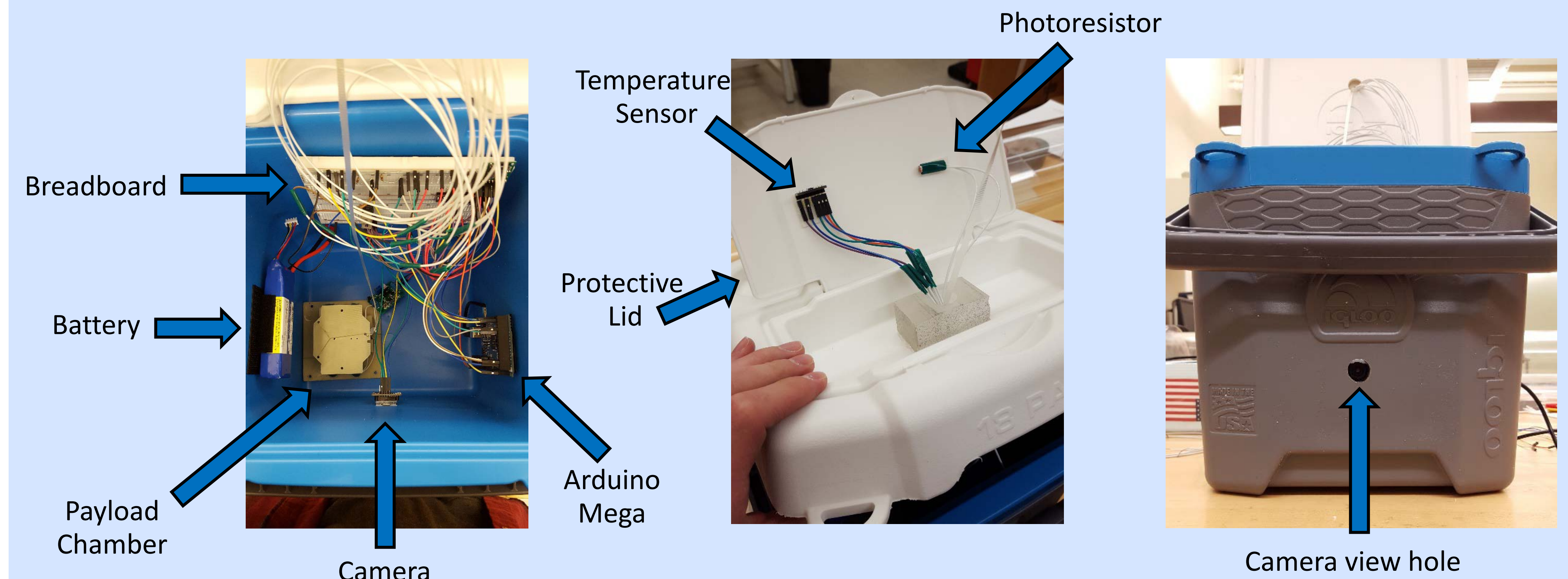
USU Physics Dept.
 USU MAE Dept.
 Space Dynamics
 Laboratory

USU College of Science
 USU College of
 Engineering

Rocky Mountain NASA
 Space Grant
 Consortium

Physical Layout

Below are pictures of the CoolerSat in various stages of development.



Results/Conclusions

The CoolerSat was left outside over a two-day period to autonomously collect and store data. The day/night cycles are obvious, and the temperatures reflect these cycles. Not shown is the graph of the outer temperature sensor data; this sensor, due to a programming bug, reported an almost-constant 42 degrees Fahrenheit for the majority of the two days.

The CoolerSat project was successful in that it displayed both good results and unexpected errors; it also taught the team how to work together and produce a working prototype. As time goes on, the CoolerSat platform will be used test various components to prepare for the high-altitude-balloon flights planned for summer 2016. These flights will ultimately give the necessary experience to launch the GASPACS CubeSat project in the future.

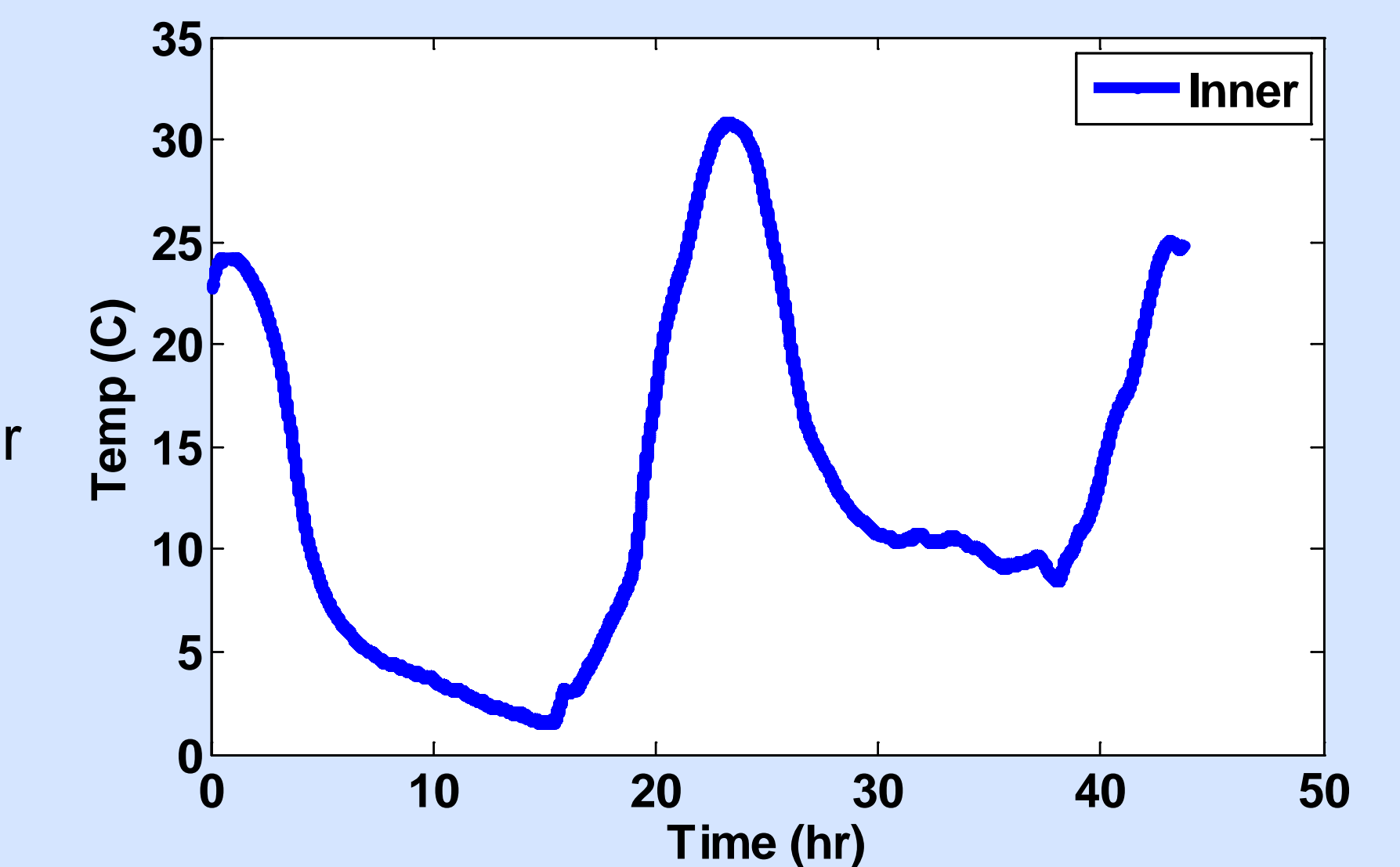
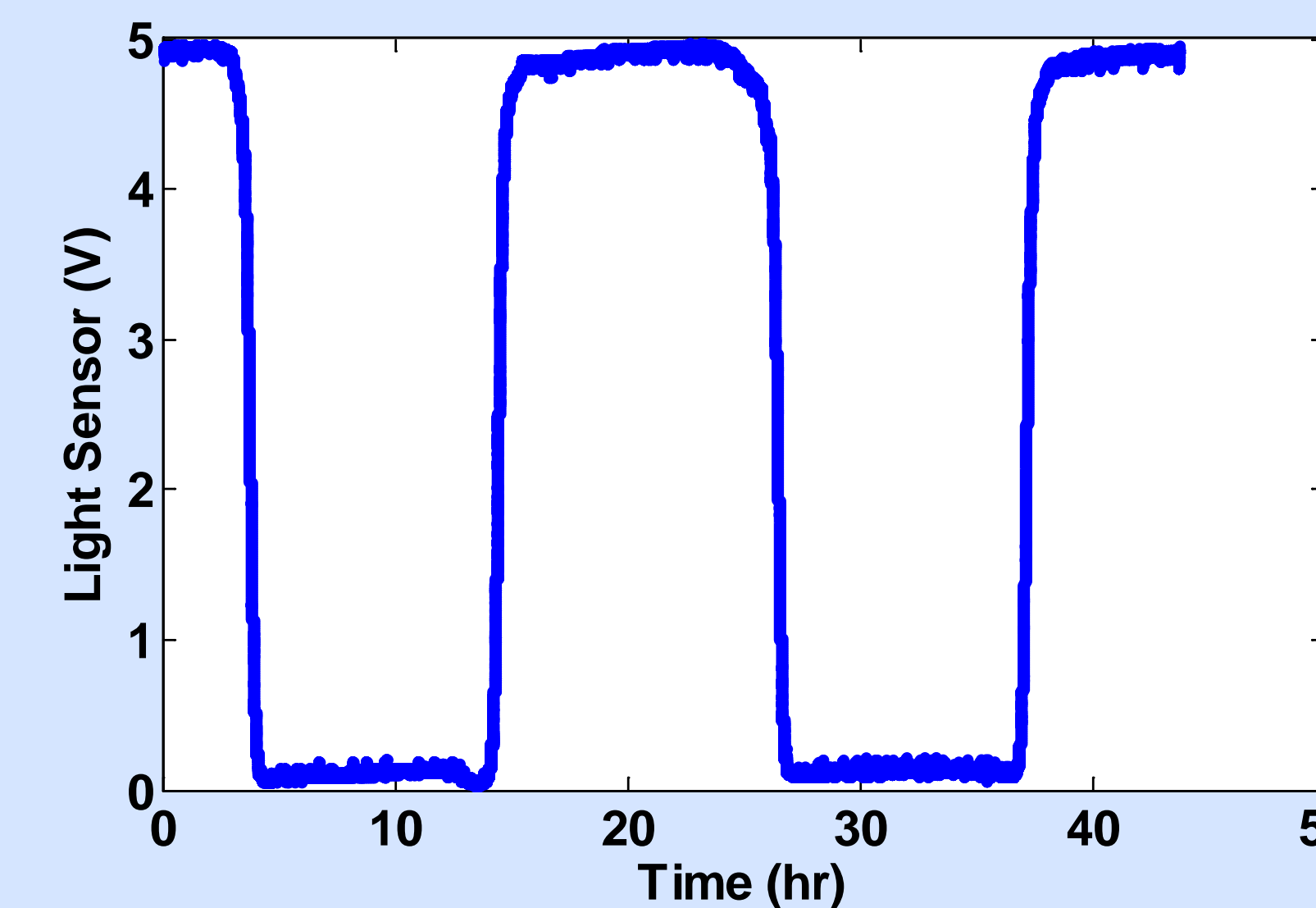


Fig. 1 & 2:
 CoolerSat
 Environment Sensor
 Results

