Status Report

October 2016

High Altitude Student Platform

Institution: College of the Canyons	**Team Manager**: Daniel Tikhomirov
Date: October 30, 2016	**Advisor**: Teresa Ciardi

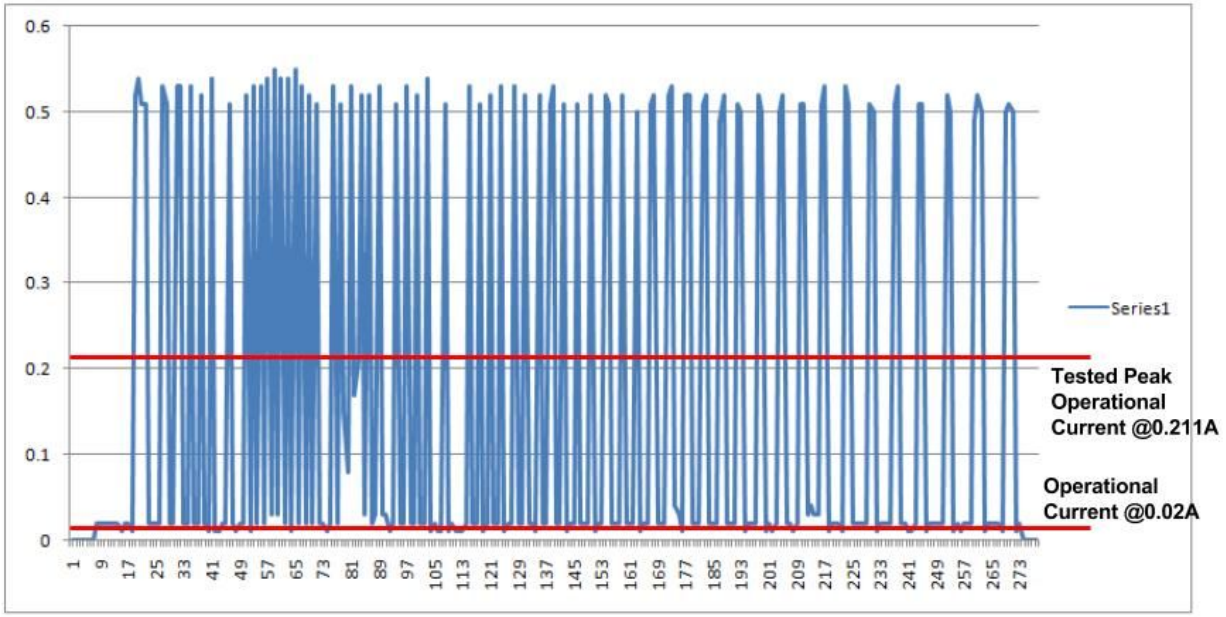
Flight Analysis

During flight, our team took shifts throughout the day to monitor the payload and to fix any problems that arose. Overall, the flight went smoothly with the exception of the HASP personnel accidentally turning the power off for our payload instead of payload #1 for about one hour. This meant that our collector was turned off for about 1.5 hours since the high voltage did not turn on until we realized to send another discrete signal. While this still gave us the rest of the entire float time to collect particles, it was inconvenient to not utilize the entire float time.

Post-Flight Inspection

Further systems analysis revealed that only one of the 5 temperature sensors failed during the flight. The only failed temperature sensor was one of the two sensors attached to the high voltage converter to monitor its temperature. The sensor that failed was the one connected to the HASP analog downlink, which explains the wild readings it was giving during flight. The motor was also tested and proved fully functional upon post-flight inspection with a peak cuurent of 0.04A @ 6VDC.

Current anomaly:



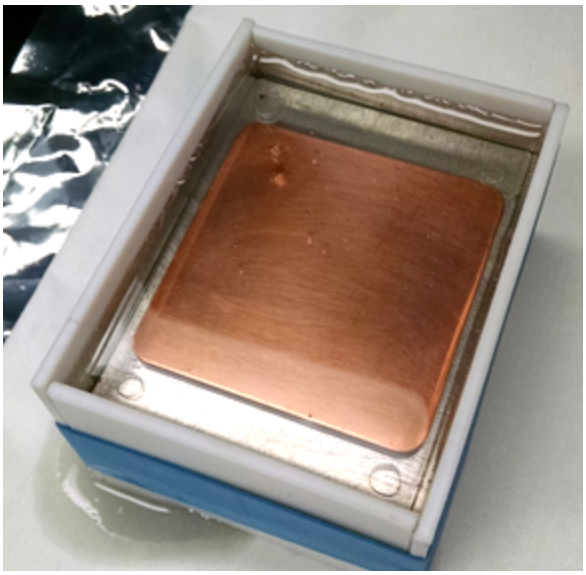
In this graph, the power for the payload was turned on for a short time to activate discrete #2 to close the enclosure and turn off the high voltage converter. This is likely a HASP-system anomaly because the peak current for small payloads is 0.5A and the current during this time fluctuated between 0.55A to 0.01A. More detailed graphs depicting total flight current will be analyzed in the coming month and presented for the last status report and science report.

Science

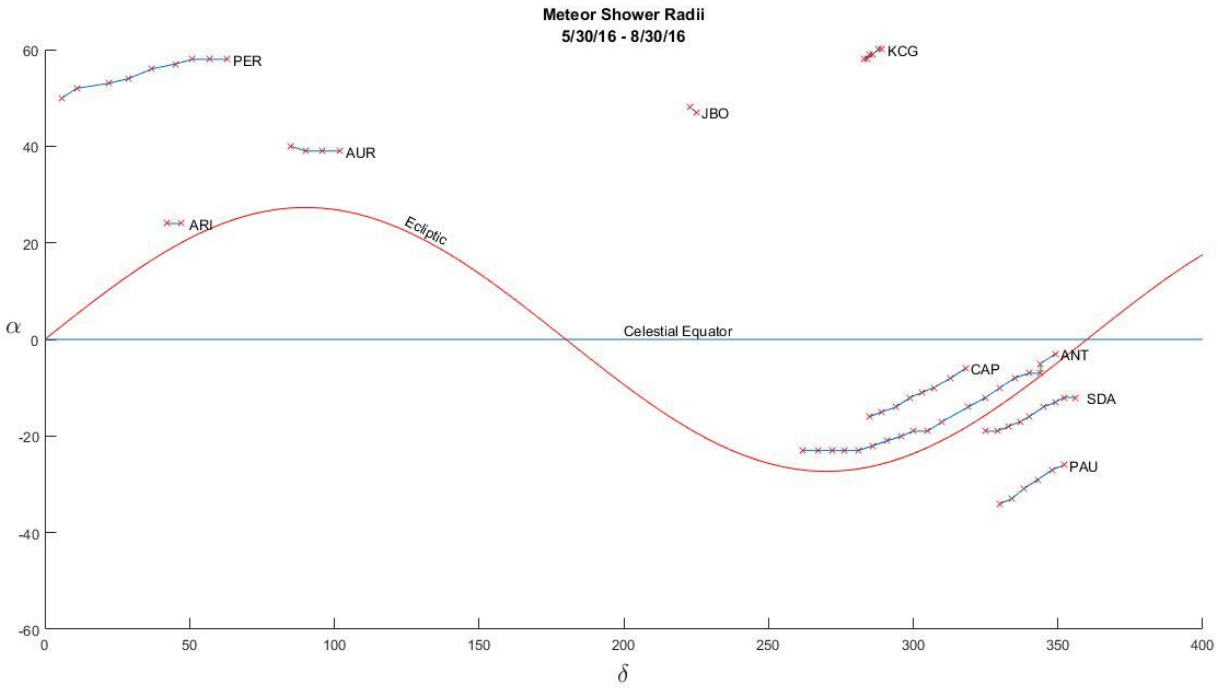
Sample Update:

The sample that was collected during flight is currently stored in clean room at CSUN until further notice. There was a biological hazard somewhere in the same building as the clean room and no one has been allowed in since mid-September. This has halted all progress for analysis of our experiment for the past month.

Hopefully, we would be able to get our sample back in **early November** to perform our planned analysis on it in time for the science report deadline in December.



Left: Copper plate inside the EPC assembly after flight **Right**: Copper plate placed inside a casting mold for acrylic epoxy embedding.



Above: Meteor shower radii distribution (right ascension by declination) from May 2016 until August 2016

Scientific analysis of the particles has progressed slowly since payload return due to minimal hours at the CSUN clean rooms that our team has access to. What we have accomplished so far has been to retrieve the copper plate from the enclosure and begin the acrylic casting procedure to fully imbed the particles in a rigid and transparent medium. However, access to the clean rooms has been fully restricted until further notice due to a biohazard warning in an adjacent lab. A similar problem has plagued the College of The Canyons clean room when we had a water main leak earlier this year right before work began on the payload. We expect access back into the clean room during **early November** once they finish the clean-up that has already quickly progressed.

Once we have our sample, we will perform a various number of procedures on it to verify if the dust particles are of terrestrial or cosmic origin. Here is an ordered list of procedures expected during the next month leading up to the science report:

1. **High-powered microscopic analysis**
    a. Catalog all particles in a grid system and identify objects of interest

2. Perform **UV/Vis and X-ray Photoelectron spectroscopy** on entire sample to detect possible rare-earth metals and space-borne volatiles
3. Analyze objects of interest with a **scanning electron microscope**.
    a. Take detailed spectroscopic analysis of each object
4. If possible IDPs found, collaborate with our contact at Johnson Space Center to receive our sample and perform further analysis.

In the meantime, our team has been working on identifying the likelihood that our payload captured cosmic dust during the flight. It was revealed after our flight, that we had actually just flown at the night of the peak of an active meteor called the Aurigids (AUR). In addition, its radii (point of origin) was close to the latitude and longitude at which HASP was flying. To fully determine where the highest flux of particles might be, we formed a meteor shower radii-drift distribution curve of the 3 months leading up to the flight. This data will later be calculated to include the flux of particles and their distribution in the stratospheric winds to create a radiant-based particle distribution map of meteor shower origin dust particles.

Much of the time spent this month has been on improving the scientific capabilities of the next payload based on what we learned during this year's flight. Returning the College of The Canyons cleanroom back into operation will be a top priority for the success of the HASP 2017 experiment.

Current Team Members:

Flight Systems • Jason Monsalve (lead) • Jayme Gimenez	EPC Systems • Nicholas Kasdjono (lead) • ~~Savannah Rousselo~~ • David Al-Nemri
Thermal Control • ~~Ryan J. Arroyo~~ (lead) • Wyatt Kurumiya • ~~Julian Drake~~	Power Management • Mindy Saylors (lead) • ~~Irfan Zaman~~
Mechanical/Structural • Patrick Gagnon (lead) • ~~Justin Hill~~ • ~~Scott Sebesta~~	Faculty Advisers • Teresa Ciardi • Greg Poteat • ~~Christine Hirst~~

Current Science/Post-flight Analysis Team:

- Daniel Tikhomirov (lead)
- Teresa Ciardi (advisor)
- Nicholas Kasdjono
- Patrick Gagnon
- Wyatt Kurumiya
- Jayme Gimenez
- Jason Monsalve
- Mindy Saylors
- David Al-Nemri