

HASP Monthly Status Report - June 2015

North Carolina Infrasound

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1 Synopsis

- Constructed, tested, and calibrated acoustic array
- Prepared plan for thermal management on payload plate and flight ladder
- Collaborated with Naval Research Laboratory to calibrate microphones at stratospheric pressures
- Started construction of data logging circuit

2 Activity Summary

The acoustic array wiring and microphone packages have been prepared. The array has undergone a series of tests to verify that all microphones have similar amplitude and frequency response (Figure 1). One Data Cube GPS cable is defective, and the manufacturer is sending a replacement. One microphone is not working correctly. A microphone that flew on HASP last year will be used instead. We are currently discussing thermal blankets with the University of North Florida team, drawing upon their expertise to help us choose how to keep the microphones from getting too hot. We have also prepared a plan to collaborate with Douglas Drob at the Naval Research Laboratory to test microphone responses at low pressures.

Additionally, the motion (accelerometer), temperature, wind speed (anemometer), and GPS time stamp are all logging to the micro-controller SD card successfully. Currently, we are creating a packet that will be transmitted over serial to HASP for downlink transmission.

3 Issues Encountered

Problems with a GPS cable and microphone were caught during testing. The issues are minor and will be resolved in early July. We also realized that the container we had picked is not rated for the stratosphere temperature and pressure. This issue has been solved as we have picked NEMA rated enclosures for our electronics which is rated for the required range of temperature and pressure. We also plan to use pressure equalizing but waterproof valves on the enclosures.

4 Milestones Achieved

First full test of HASP 2015 acoustic array. First full functionality test of 24-hours of continuous data logging done with the wind, motion and GPS logger.

5 Team

The student team consists of Daniel C. Bowman (University of North Carolina at Chapel Hill), C. Scott Johnson (North Carolina State University) and Jacob F. Anderson (Boise State University). Jonathan M. Lees (UNC Chapel Hill) and Rachana A. Gupta (North Carolina State University) serve as Faculty Advisors.

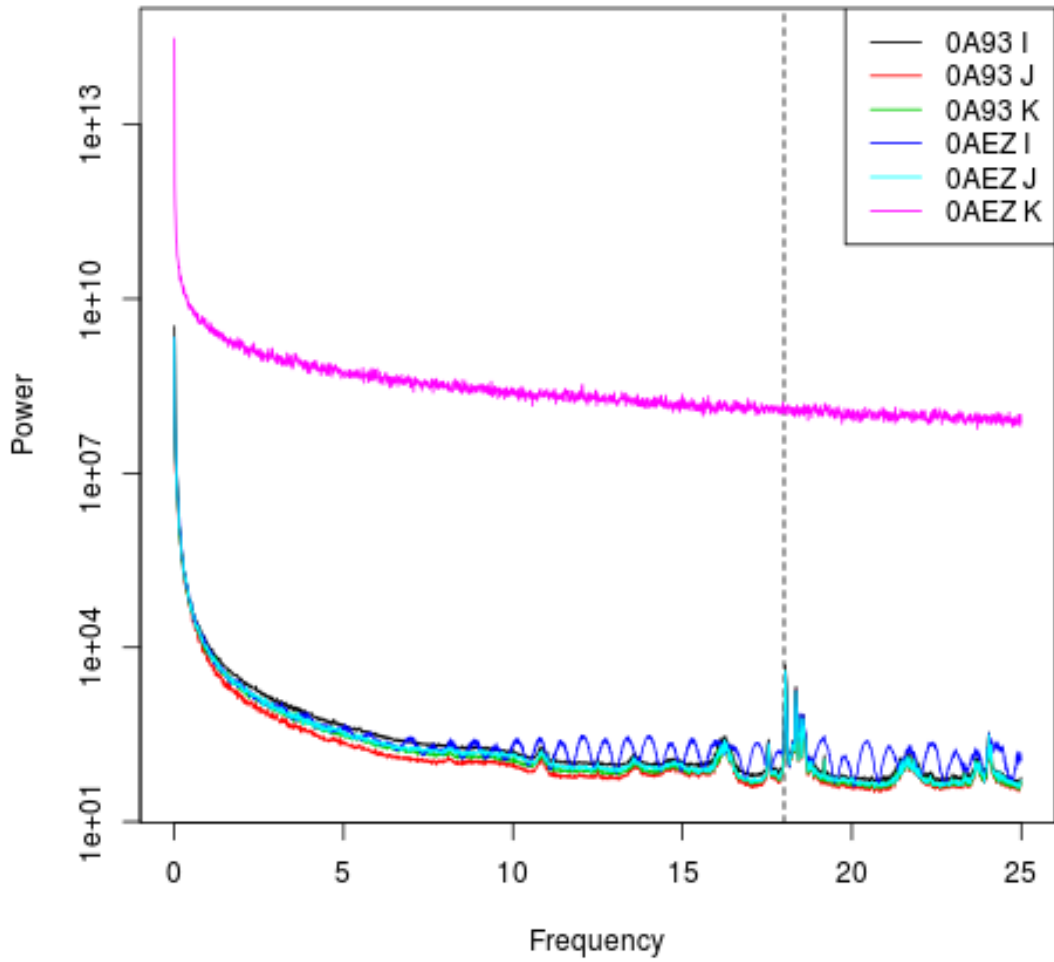


Figure 1: Power spectrum of HASP 2015 array during a 33 hour outdoor test. Microphone AEZ K is the defective one.