

HASP 2013
UND-UNF Payload
Monthly Status Report for September 2013

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UND-UNF team did the following work during September 2013:

- (1) HASP 2013 balloon flight was launched on Monday, September 2, 2013. We sincerely thank to the NASA- CSBF and HASP team to launch the balloon on the Labor Day holiday. The payload was recovered after the flight. The payload was found in good shape. After giving power to recovered payload, we found that all sensors and circuits are in good working condition. There was no damage on the payload body.

- (2) During flight, data generated from total 24 gas sensors and 3 light sensors mounted on 3 sensor boxes were measured. Temperature on the sensors, atmospheric pressure and altitude were also recorded. All sensors and data communication program were worked well during entire flight period. Fig. 1 to 11 shows some of our plots which shows that our payload worked well during the flight and measured data.
- (3) Most of ozone sensors worked well and measured ozone profile in stratosphere. The measured ozone profile by most of ozone sensors have peak from altitude about 20,000 to 32,000 km. The light sensors also have peak similar to the ozone gas sensors. This prove one of our science objectives that in the presence of UV light oxygen converted into ozone gas and hence concentration of ozone gas increased.
- (4) Our GPS was failed to measure after the altitude around 60,000 feet. Then, we requested Michael to deploy the command to switch to HASP GPS. The manufacturer gave us the new instructions for software but it did not worked. It might be blocked to communicate by the Government regulation. We will take care for the next year flight.
- (5) Data analysis of all data files are going on. We are highlighting some of our plots here. Rest of results and plots will be submitted in the next month or so.

Power budget:

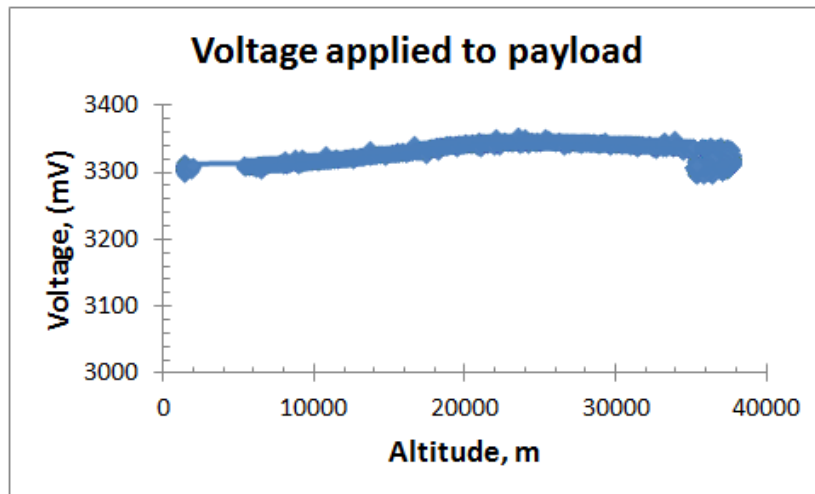


Fig.1. Voltage applied to the payload during the flight.

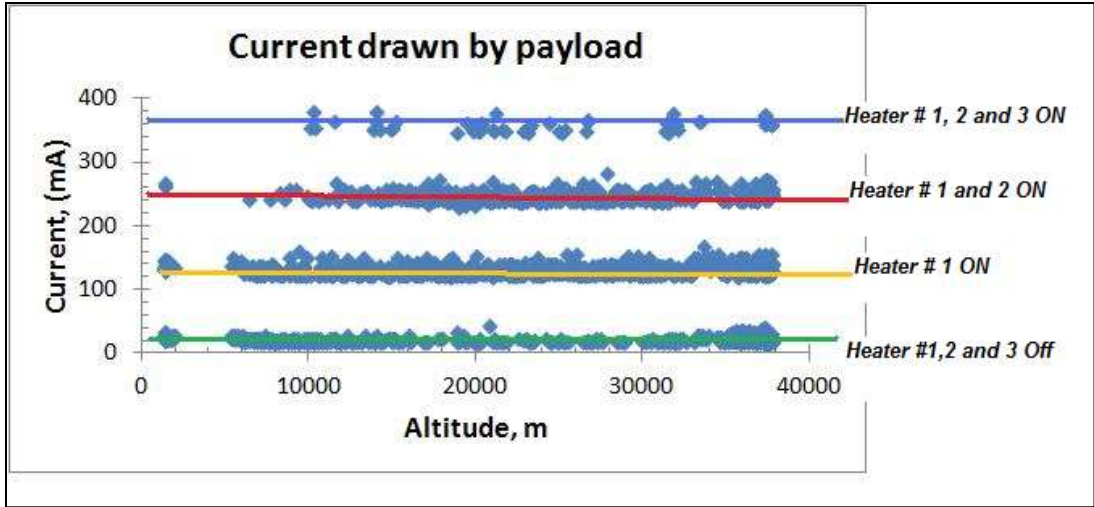


Fig.2. Current consumed by the payload during the flight.

Thermal stability of payload

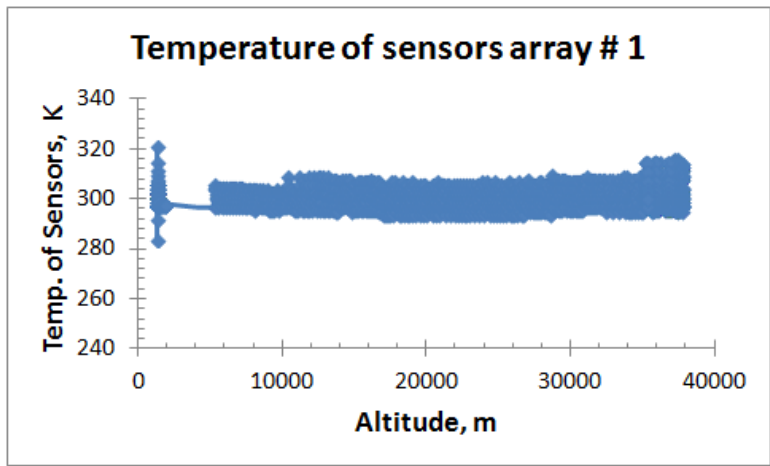


Fig.3. Temperature of sensors array #1 during flight

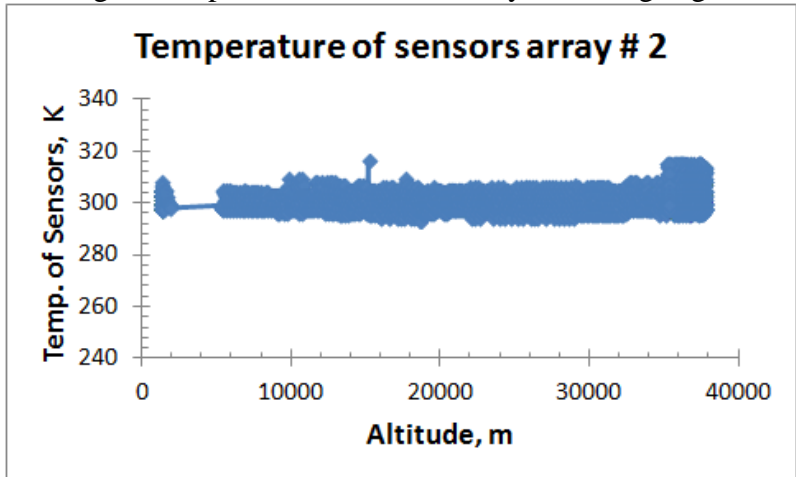


Fig.4. Temperature of sensors array #2 during flight.

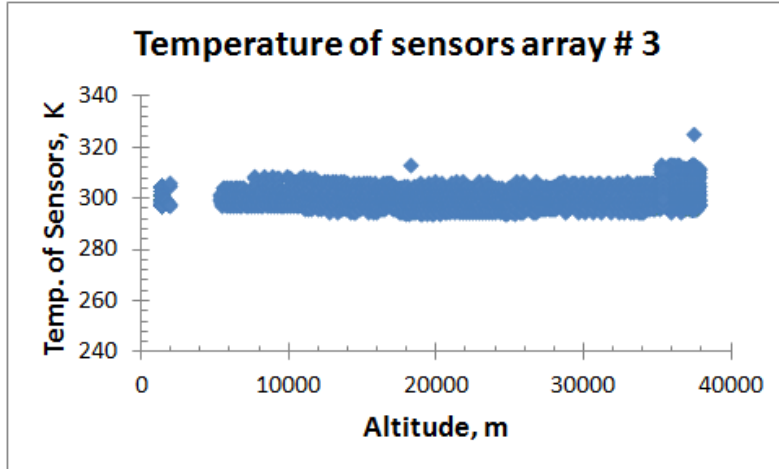


Fig.5. Temperature of sensors array #3 during flight.

| Sensors Box # | 1 | 2 | 3 |
|------------------------|-------|-------|-------|
| Average temp (K) | 300.6 | 300.5 | 300.6 |
| Standard deviation (K) | 5.5 | 5.6 | 6.0 |

Table1. Average temperature and standard deviation of temperature of sensors array 1, 2 and 3 during the flight.

Response of pressure sensor

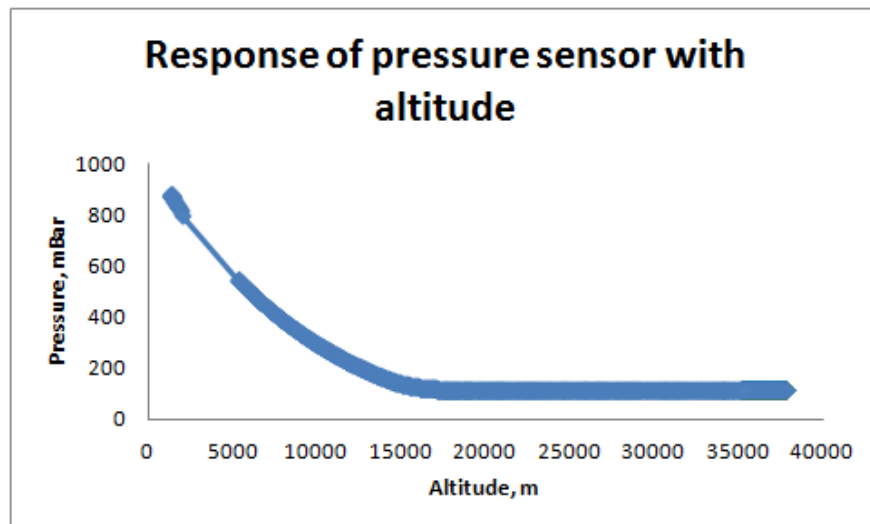


Fig.6. Variation of pressure with altitude. Pressure sensor was saturated at pressure about 110 mBar due to its technical limit. We need to replace it by better version for the next flight.

Response of photo sensors

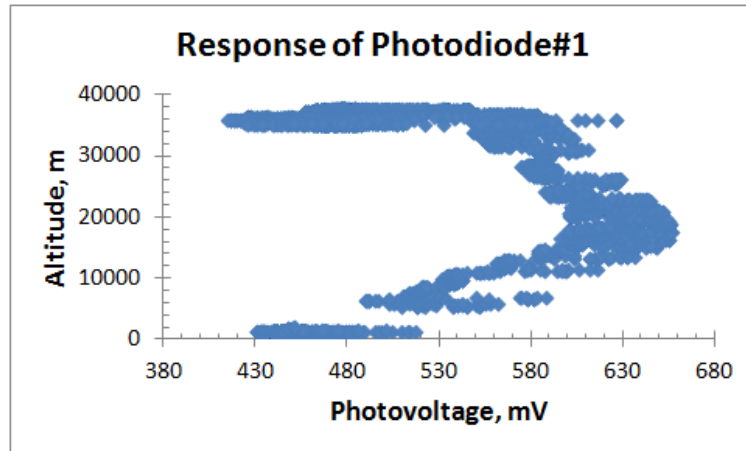


Fig.7. Response of photodiode#1 with altitude to detect the presence of sunlight.

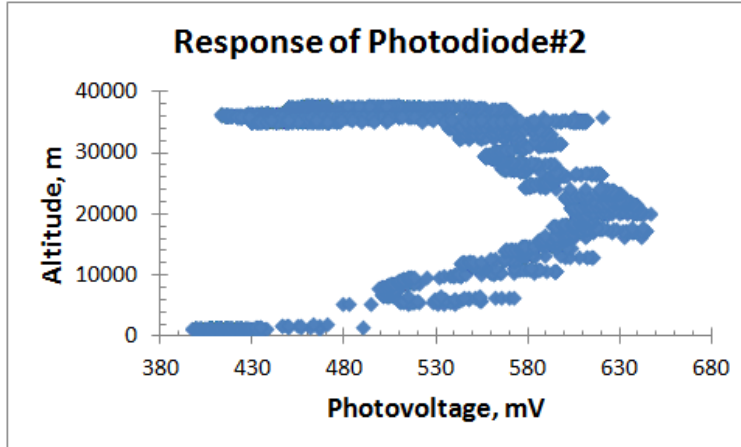


Fig.8. Response of photodiode#2 with altitude to detect the presence of sunlight.

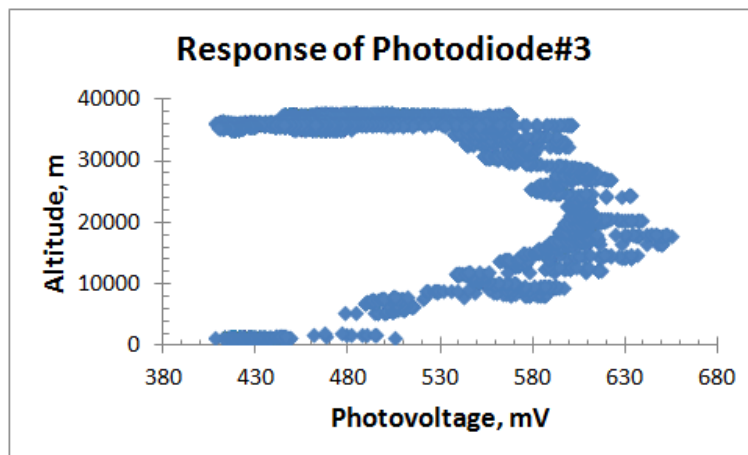


Fig.9. Response of photodiode#3 with altitude to detect the presence of sunlight.

Response of ozone gas sensors

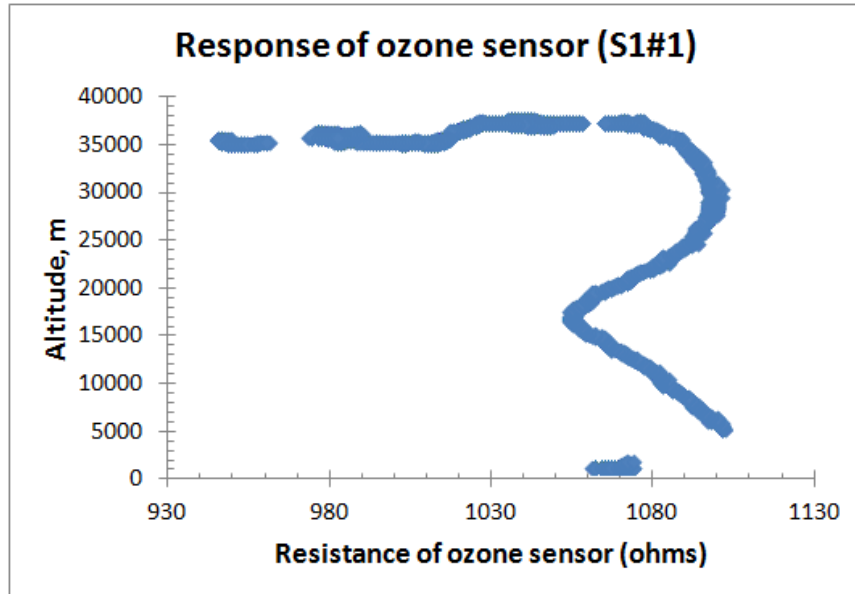


Fig.10. Response of ozone sensor (S1#1) during the flight.

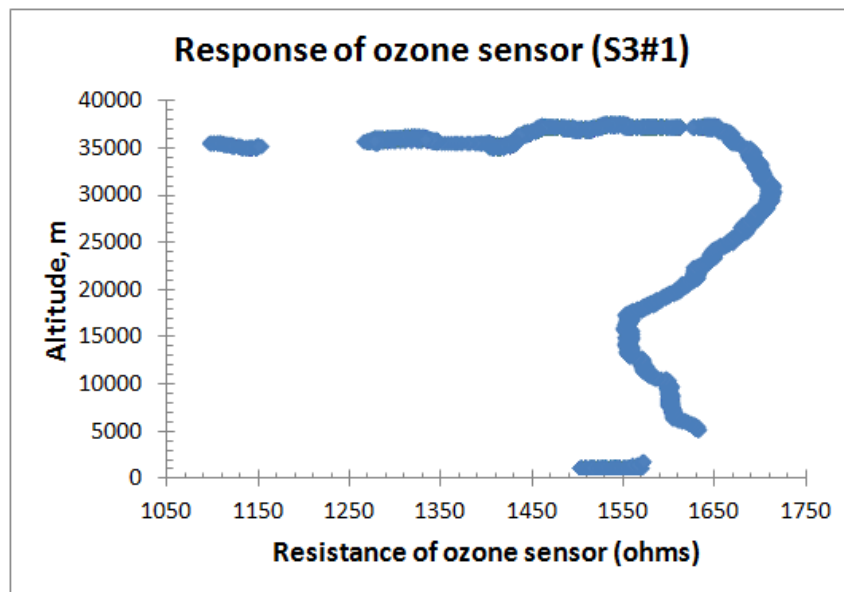


Fig.11. Response of ozone sensor (S2#1) during the flight.