



BEAR-7 insights

Sunday 2022-11-13

07:44—11:19 H

Project Leader: Lih Wei 9V1LW

Members: Fu Hang 9V1FH, Choong 9V1CV, Chew 9V1YP, Wai Phyoo

Guest: Parent + Son

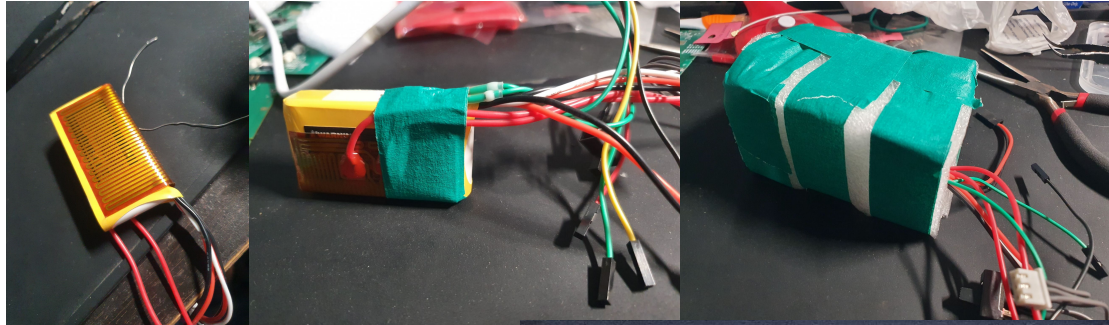




Lih Wei

CODING

- No observed bugs, just potential for further improvement
- Continuous SSTV on the way down
 - Could have better detection of free-fall so we start earlier
- Remote commands
 - Will be great if we can adjust SSTV remotely, or request for reboot



```
Smart Force Sensor
Load1= 38.6 g Load4= 26.5 g
Load2= 52.8 g Load3= 83.7 g
Total Load= 201.6 g
```

PAYLOAD

- Continued with new method that only insulates battery & kapton heater
 - Managed to survive the trip + search, total 4 hours
- Weight increased to 201.6g (Previously 194.0g)



Lih Wei

PAYLOAD

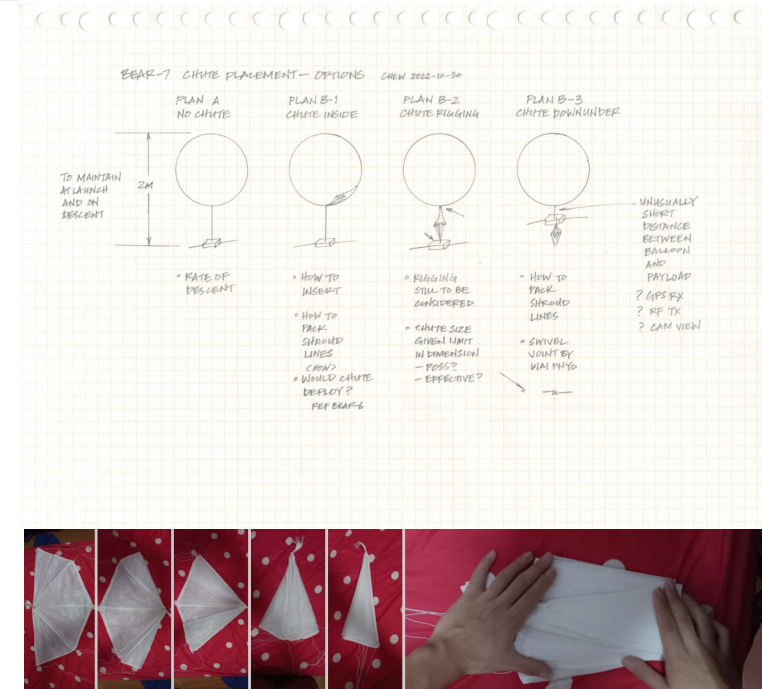
- Test out shiny new MAX-M10S
 - Absurd 32 tracked satellites throughout the flight
 - Supports all constellations (previous 8Q only supports GPS/GLONASS)
 - Built-in SAW + LNA, requires bypassing external SAW + LNA
- Determined cause of random reboots from previous flights
 - Long camera cable acting as antenna
 - Causes spurious noise, confusing camera library
 - Simple solution: wrap with foil



Wai Phyto

TEST2: In-Balloon Parachute

- Trying different methods of attaching balloon
 - Need to prevent entanglement and ensure full opening
 - Remaining within 2m size limit very tricky
- Same method, with 2 changes:
 1. Hinge to reduce entanglement when payload spins
 2. Different parachute folding technique
- Did it work? Partial success.
 - Went from 20m/s to <10m/s
 - But could be lower
 - Theory: Parachute entangled with balloon fragments



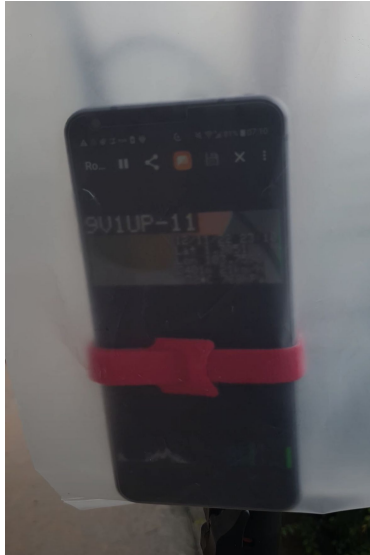
Lih Wei

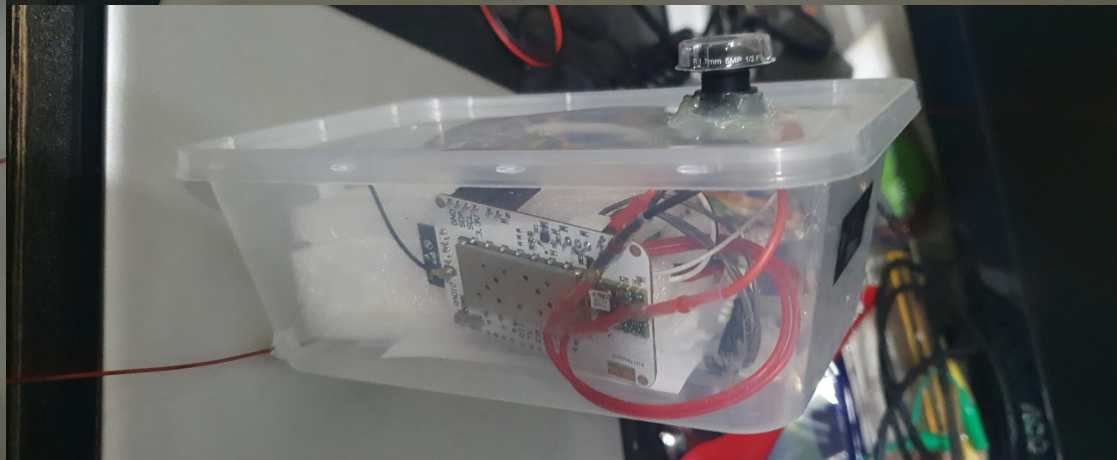
HELIUM TANK

- Continued with previous supplier
- For party balloon use
 - <https://www.partywholesale.com.sg/helium-tank/medium-helium-tank-3-days-rental-balloon-kit/>
 - \$99.90 (price has since increased another \$10)
 - 10L tank, assured and specified to be 99.9% pure
- Due to bigger HAB800, additional helium required
 - <https://www.partywholesale.com.sg/helium-tank/small-helium-tank-3-days-rental-balloon-kit/>
 - \$59.90 (price has since increased another \$10)
 - 6L tank, 99.9% pure
- Total ~\$160 just for the gas 😞
 - Yet, still not sufficient



Better (“Better”?) GS Structure

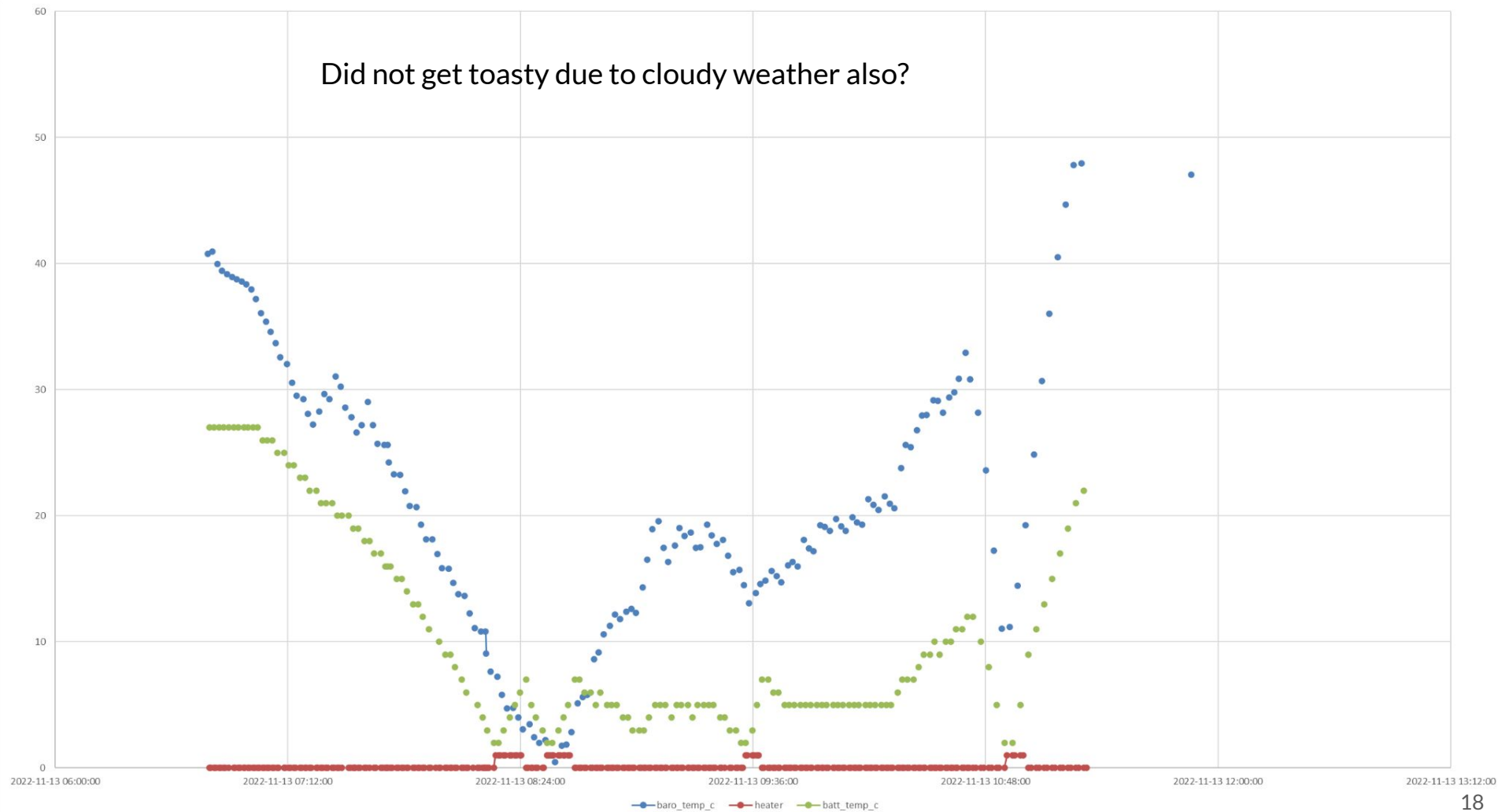


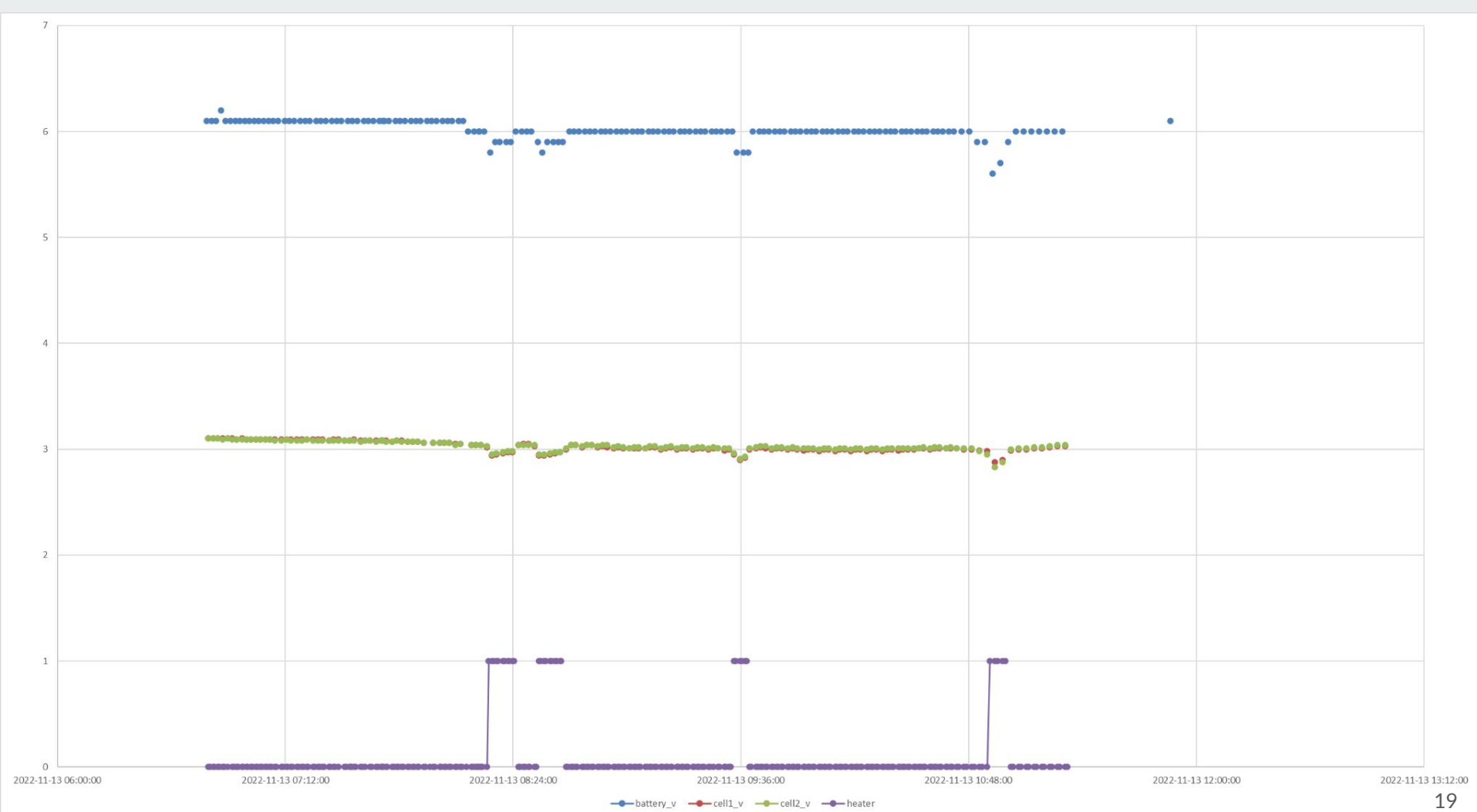


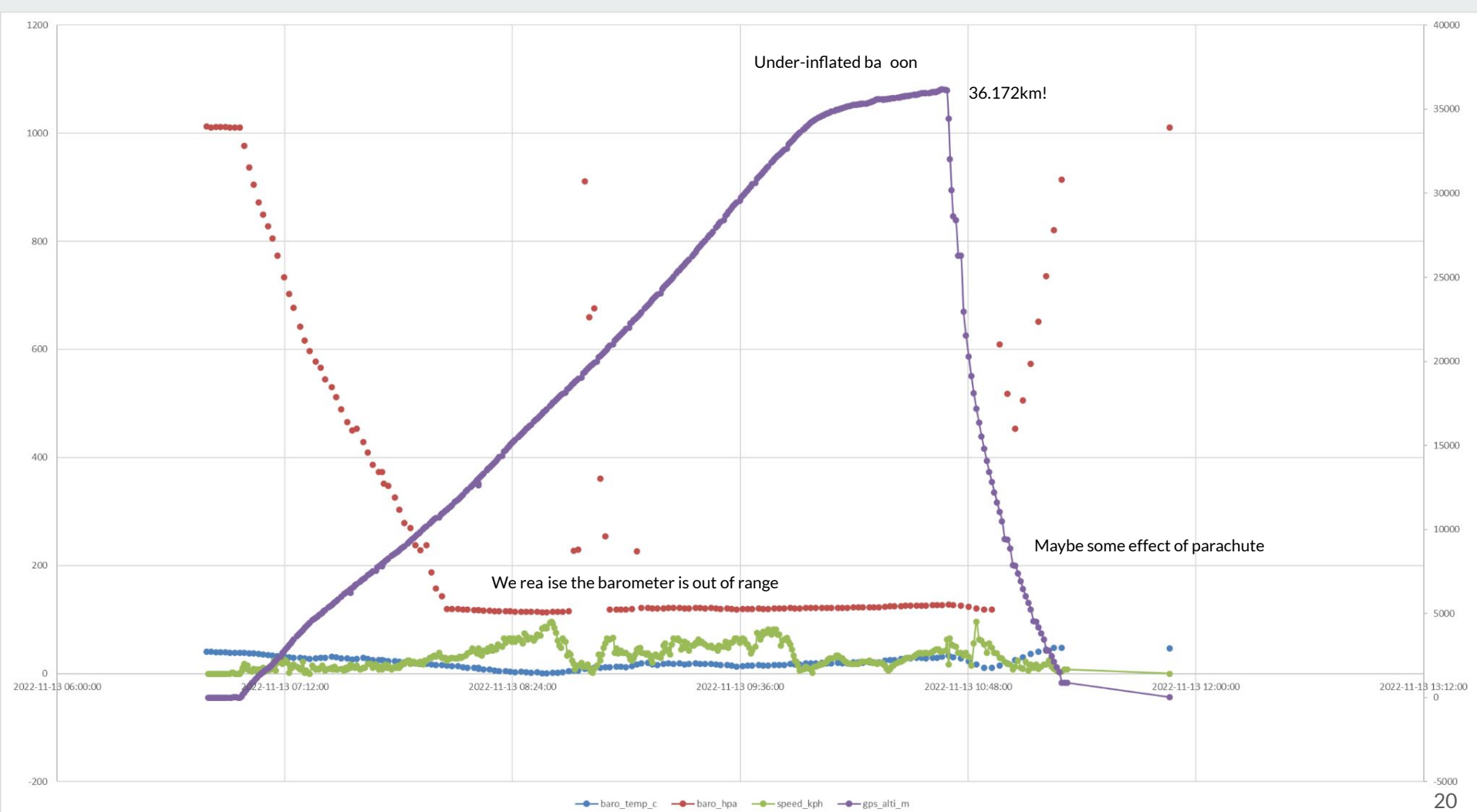




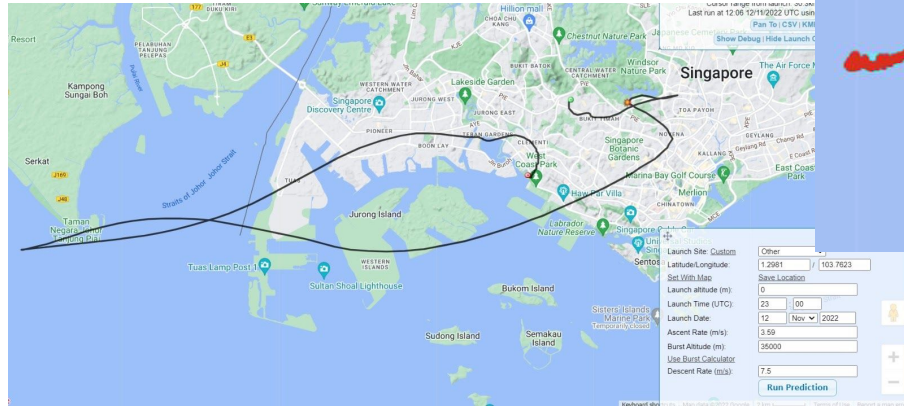
Did not get toasty due to cloudy weather also?

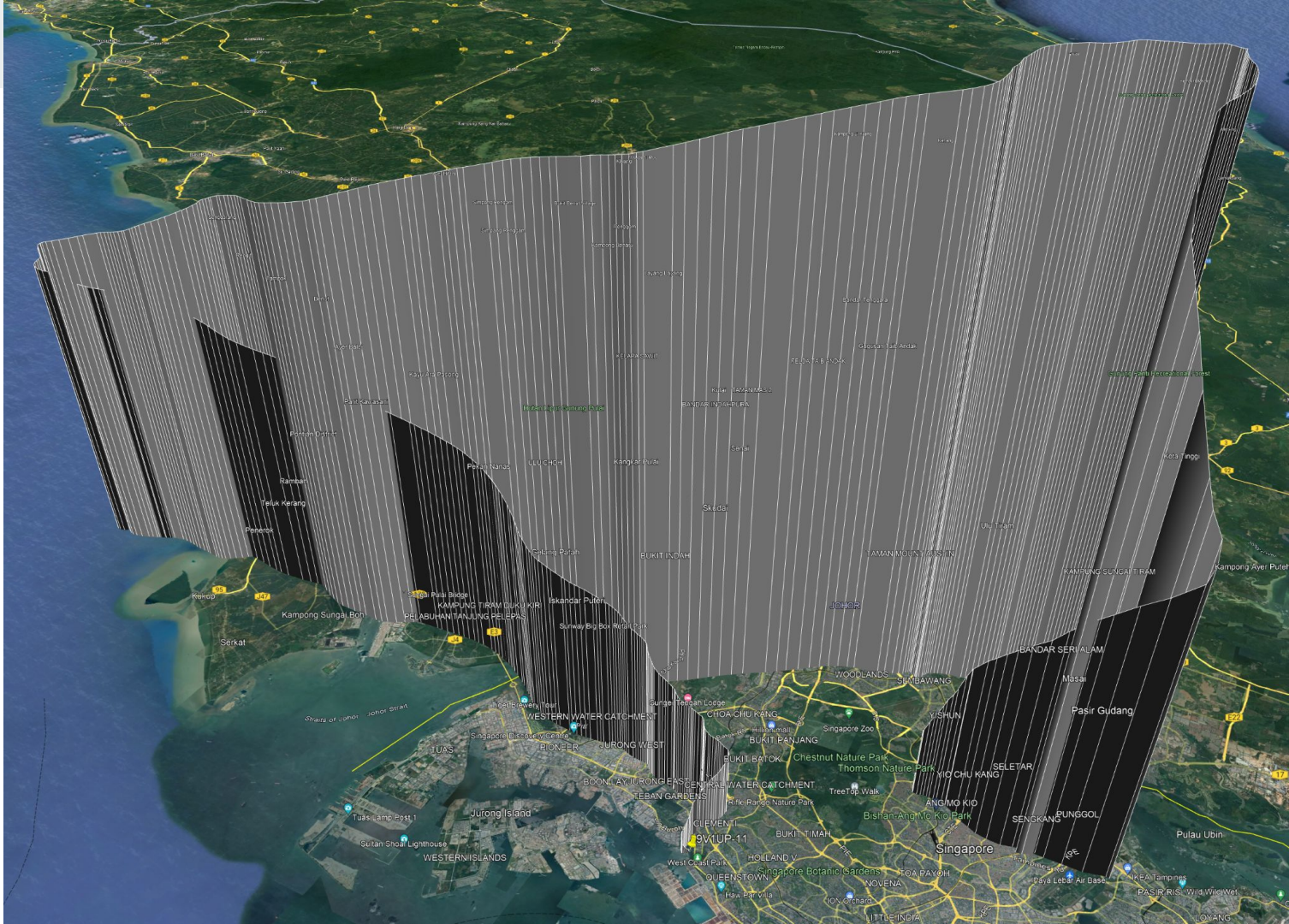






PREDICTED vs ACTUAL FLIGHT PATH





9010P-11

12/11/22 22:45

Lat 1.3000

Lon 103.7500

594m 0km/h

32°C 1012hPa

BEAR?

Recovered!

Seems like entanglement still occurred,
likely getting caught in the balloon
fragments on descent





Data available

All design + firmware + flight data available on Github

Electronics: <https://github.com/xieliwei/BEAR4-hardware>

Firmware: <https://github.com/xieliwei/BEAR4-firmware>

Flight data: <https://github.com/xieliwei/BEAR4-firmware/releases>

(Check under the “assets” section for each flight)



Thank you.

