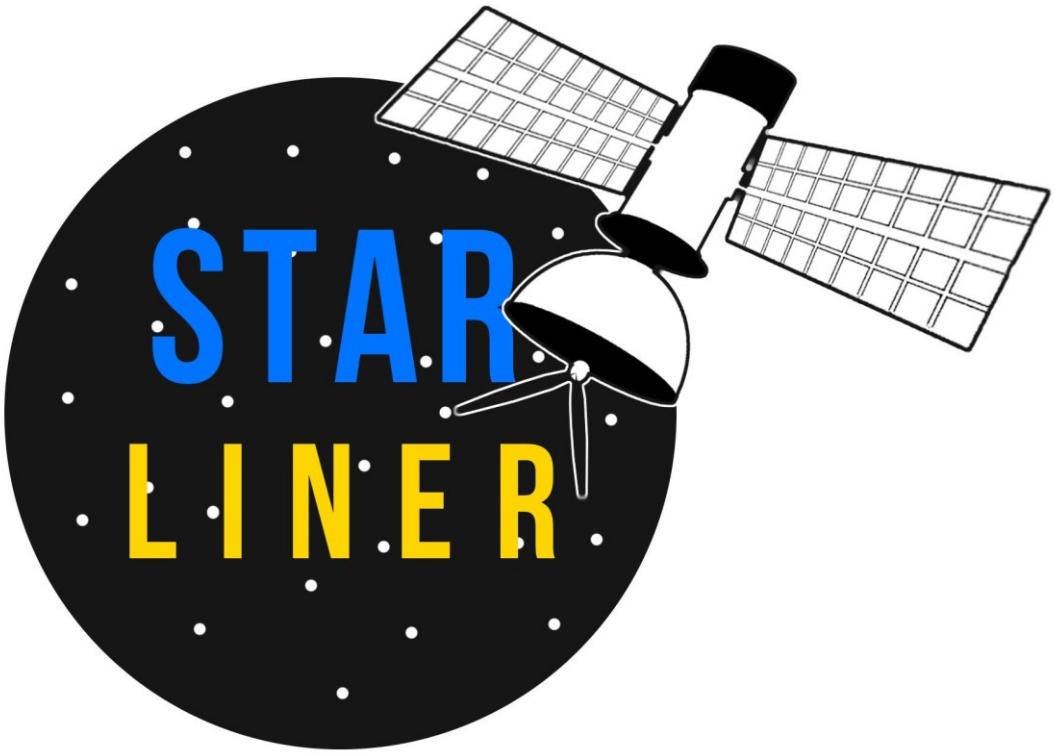
Starliner

Pre-final update



Team Name: Starliner
Country: Poland

Table of Contents

1. Marketing actvities

After announcing the total transfer of the finals to the online version, we were slightly stagnant, which significantly silenced us in terms of marketing activities.
Despite this during pandemic lockdown our project printer and school printers were printing parts for protective masks for medics from near hospital.
https://bit.ly/3fzCVQj
https://bit.ly/2WonDpX
Immediately after the news of the resumption of the finals in Leszno, we began to intensify work. We started with high-altitude tests using a hang glider.
https://bit.ly/32kCF3L

After the finals, we will visit companies that helped us financially and with advice and we would like to thank you with commemorative emblems.

2. Main changes

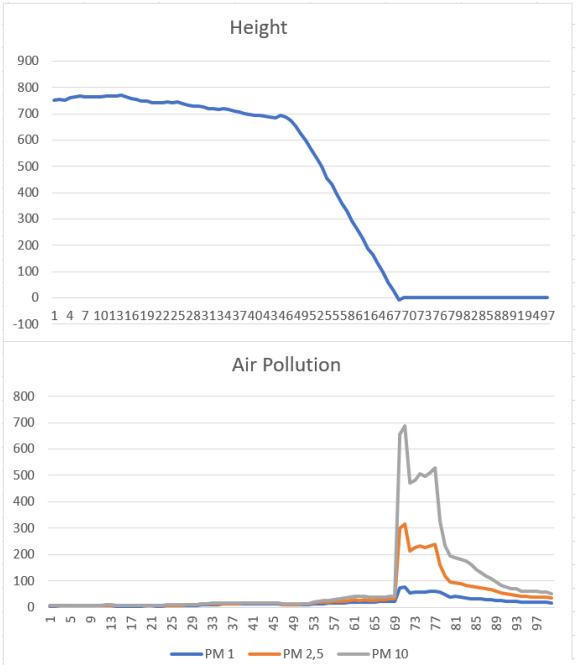
Due to the greater amount of time, we decided to improve our following antenna. We have strengthened the construction and added Altimu-10 v5 which will move with the antenna. Thanks to this and program changes, the system knows in which direction the antenna is pointing. Thanks to it, we do not have to set it in the initial position, we can give it manually wanted angle to be directed and in case the engine loses a step, the system will notice it and correct the error.

3. Results of tests

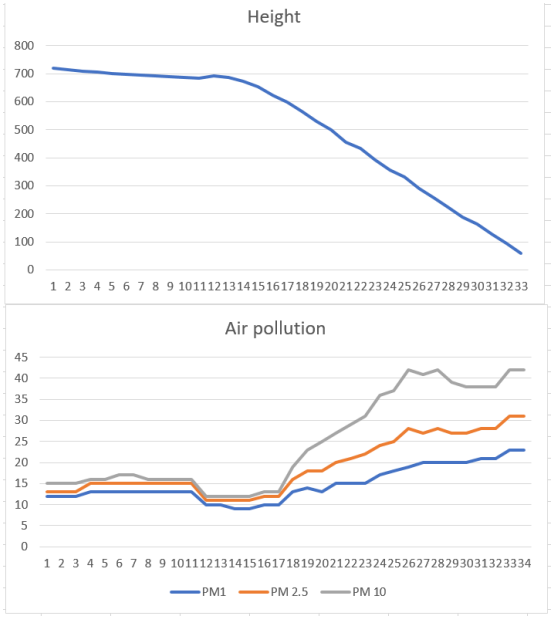
3.1 Graphs and conclusions

3.1.1 "Final" CanSat

During the final tests of CanSat, an "accident at work" happened - the parachute's line broke, which caused a fall from a height of about 700m. The flight was fast, but some data was still collected. The device fell onto the field at a speed of about 160km/h. After hard landing, our CanSat turned off for about 4 seconds, then the operation returned to normal and began collecting data (we can see "spike" on Air Pollution graph short time after landing, it's probably caused by dust raised during impact. We received the last signal about the location when it was 140m above the ground. After going to this area, our J-type antenna caught the signal so we could find it more easily.



Graph 1 Air Pollution before, during and after fall (above) and during exact fall (below).

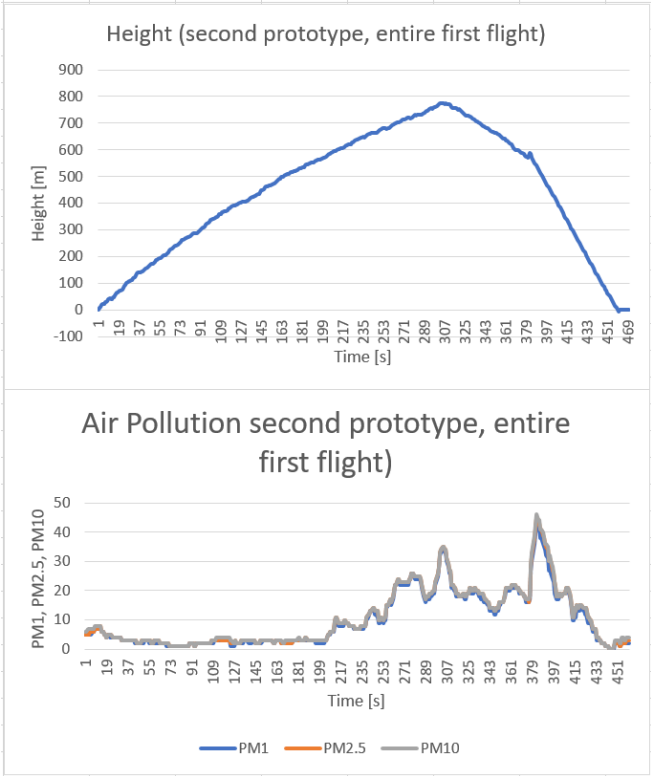


As a result of the impact, the only thing that was damaged was the cover, we made detailed review which showed no other dysfunctions.

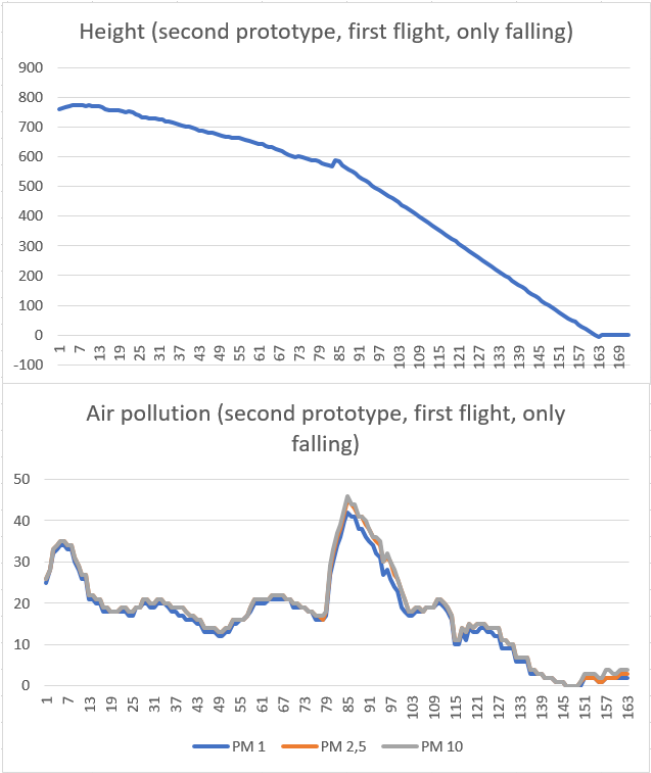
Photo 1 CanSat after hard landing

3.1.2 Second Can Sat Prototype

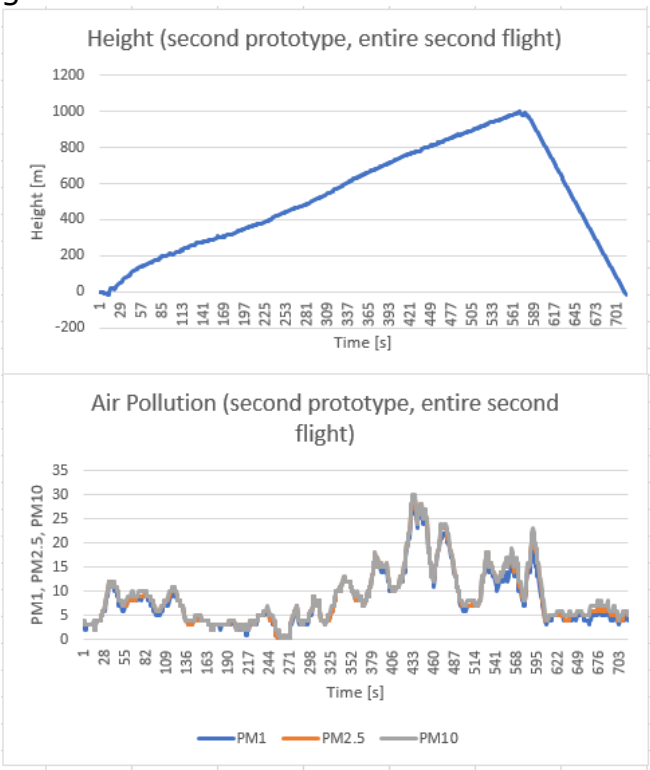
Thanks to kindness of our paraglider pilot, the second prototype made 2 flights. The results of PM 1, PM2.5 and PM10 dust are unobvious, CanSat probably fell through the zones where the hang glider flew, which caused the exhaust gas remaining in the air to inflate the results.
In the first flight we can see that air is more polluted above 600m (which is suprising and unexpected).



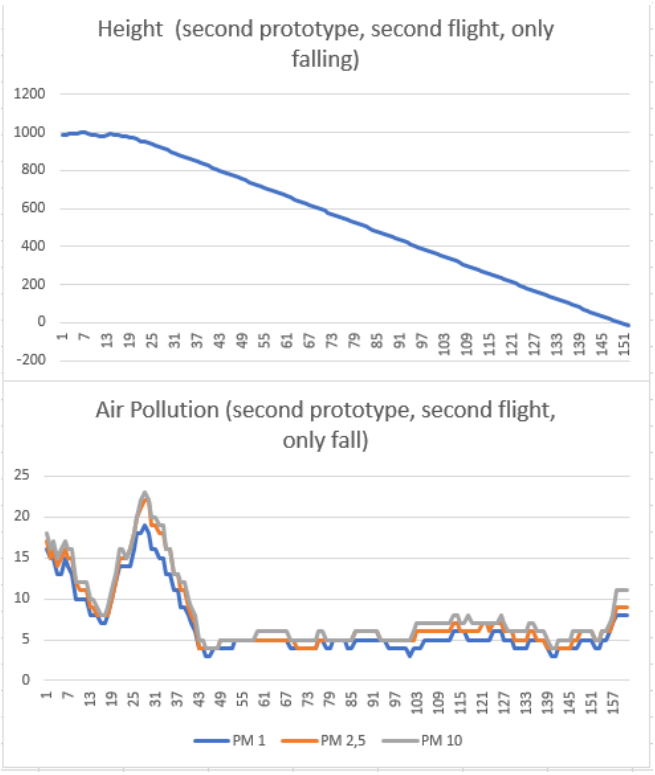
Graph 2: Air pollution and height of the entire first flight (above) and only fall (below).



Second flight bring similar results, air is still more polluted than near the ground.



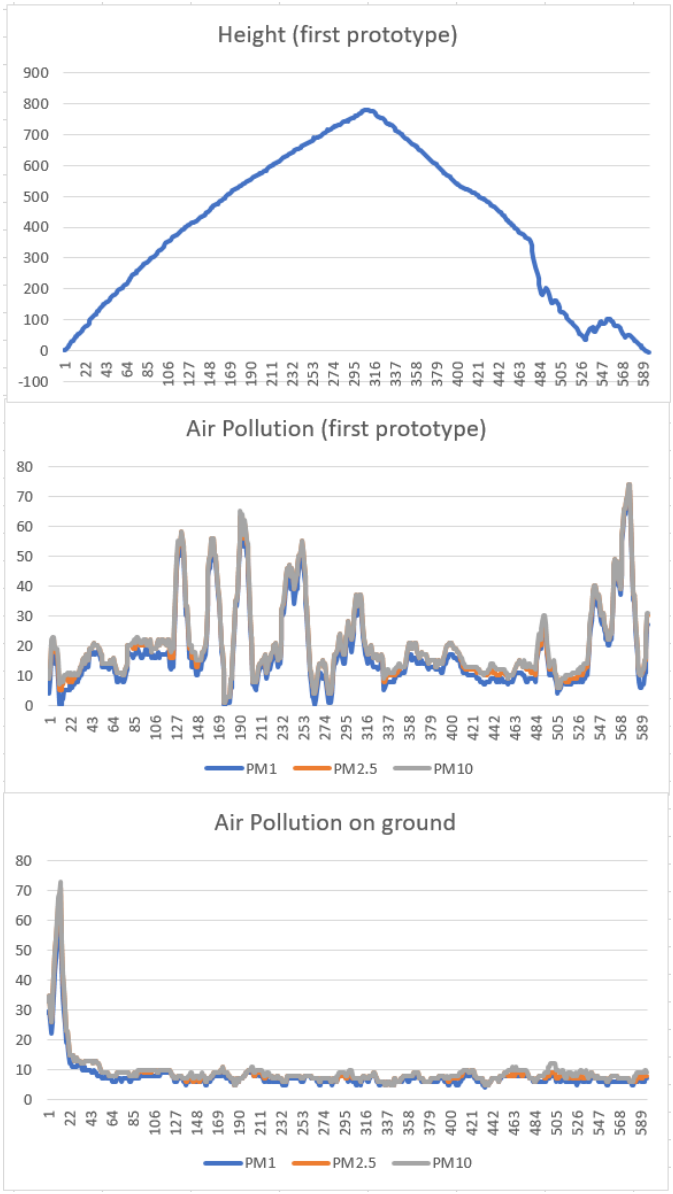
***Graph 3:* Air pollution and height of the entire second flight (above) and only fall (below).**



3.1.3 First prototype (attached to the glider)

The first prototype was attached directly to the powered hang glider because we did not have a third spare parachute.

At the very bottom graph we can see exact moment when the hang glider was taking off and fanned exhaust gases around our ground station.



Graph 4: Height and Air Pollution from hang glider compared to Air Pollution from ground station.

4. Socials

Our Facebook page:
https://bit.ly/2CGJG45

Our YouTube channel:
https://bit.ly/3jazT7d

Our website:
https://bit.ly/2DNlxtp

Our school page:
https://www.zsz-gostyn.com.pl

Our school Facebook page:
https://bit.ly/3h6kN0C

5. Summary

We know that the test results and design changes were not required, but we wanted to share the unexpected results of air pollution tests and our idea to improve the antenna.

We are proud that we managed to get this far only with our own work and a little consultation. We learned a lot in less than a year, it opened up many possible personal development paths.