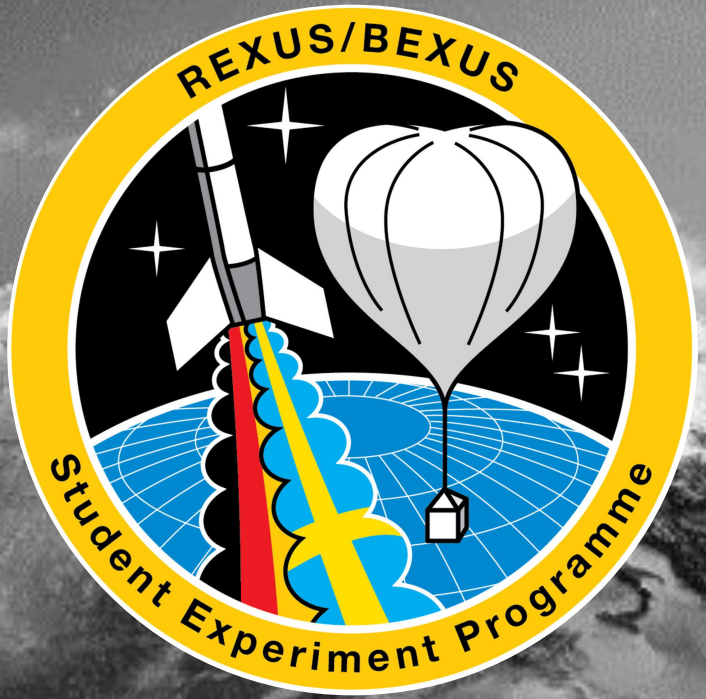
Ecowise Experiment

Presentation by : Ypatia Dami

Date: 15/02/24

Rexus/Bexus Program



B.E.A.M in Bexus 30/31

BEAM

Beyond Earth Aristotle Missions

Ecowise(Ecological Computations with low-cost setup)

Measure the distribution of O3 and CO2

Use low cost ground based sensors

Create favorable conditions so the sensors are functional on extreme ambient conditions

Preserve the favorable conditions in the entire stratospheric flight

Rexus/Bexus 13 Timeline

-Experiment Selection Workshop at ESA-ESTEC (November 2019)

-Student Training Week at SSC's Esrange Space Center (February 2020)

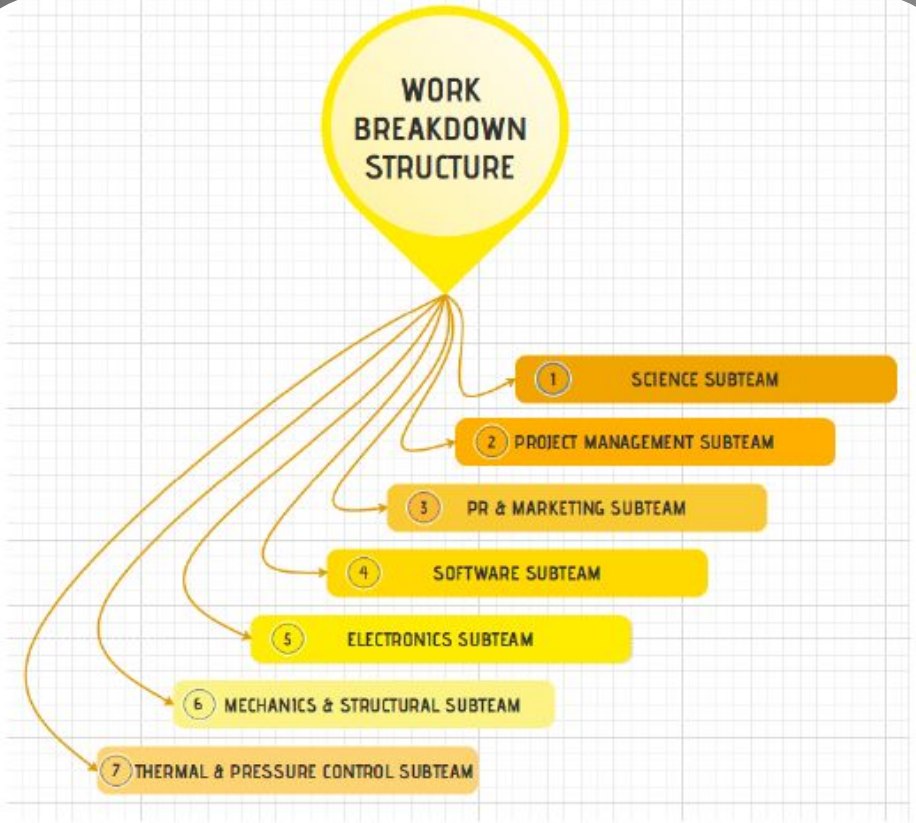
-Preliminary Design Review at SSC's Esrange Space Center (February 2020)

-Critical Design Review in virtual format (May 2020)

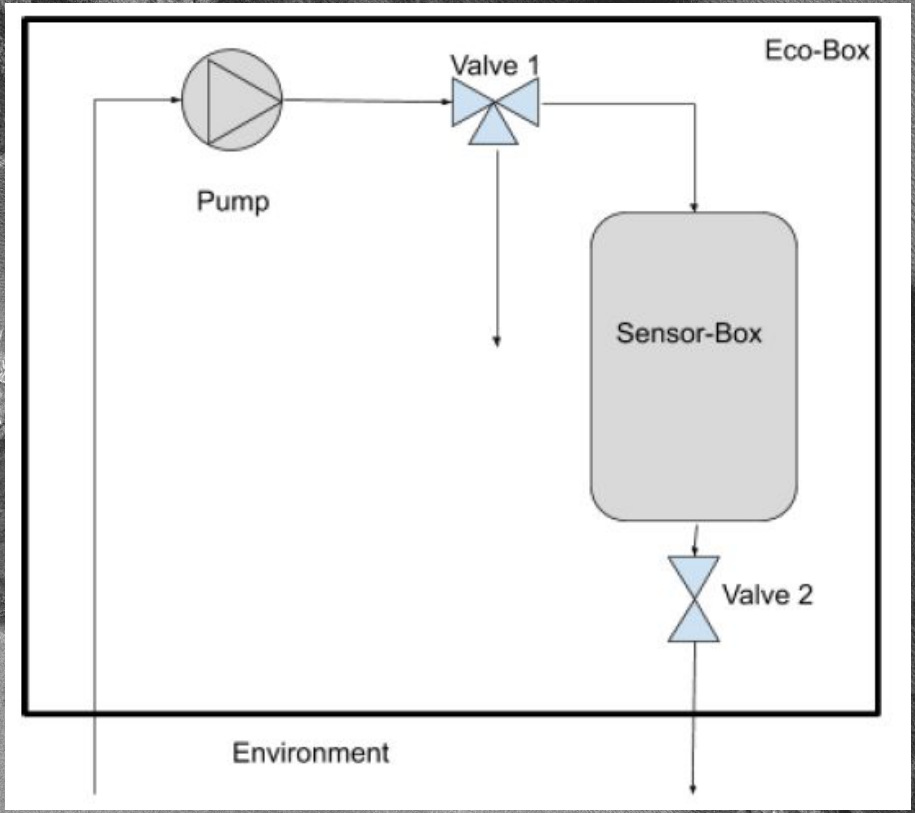
-Experiment Acceptance Review in Aristotle University (August 2021)

-BEXUS 30/31 Launch Campaign at SSC's Esrange Space Center (October 2021)

Subteams

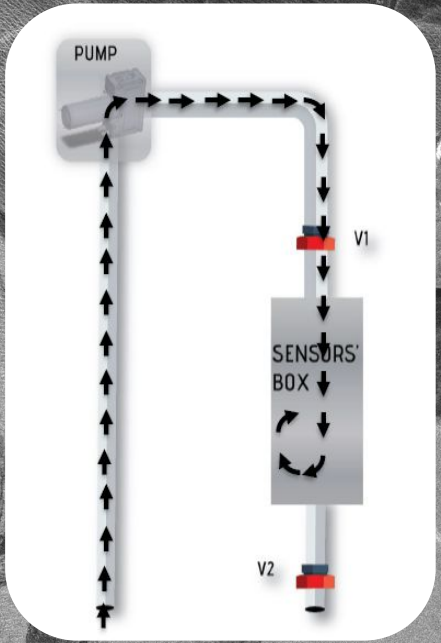

WORK BREAKDOWN STRUCTURE
1 SCIENCE SUBTEAM
2 PROJECT MANAGEMENT SUBTEAM
3 PR & MARKETING SUBTEAM
4 SOFTWARE SUBTEAM
5 ELECTRONICS SUBTEAM
6 MECHANICS & STRUCTURAL SUBTEAM
7 THERMAL & PRESSURE CONTROL SUBTEAM

Gas Circuit

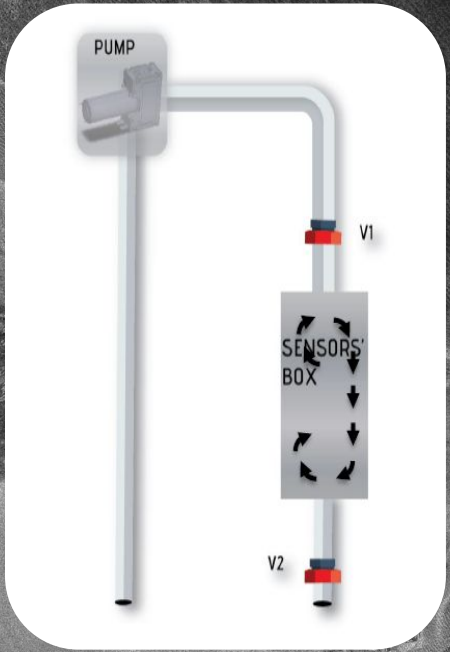


Air Flow Stages

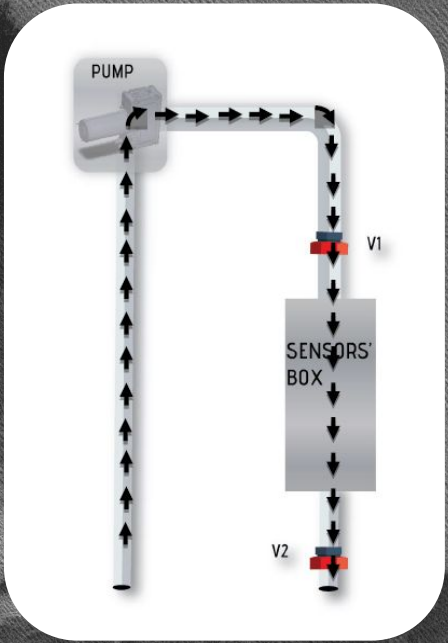
Stage 1



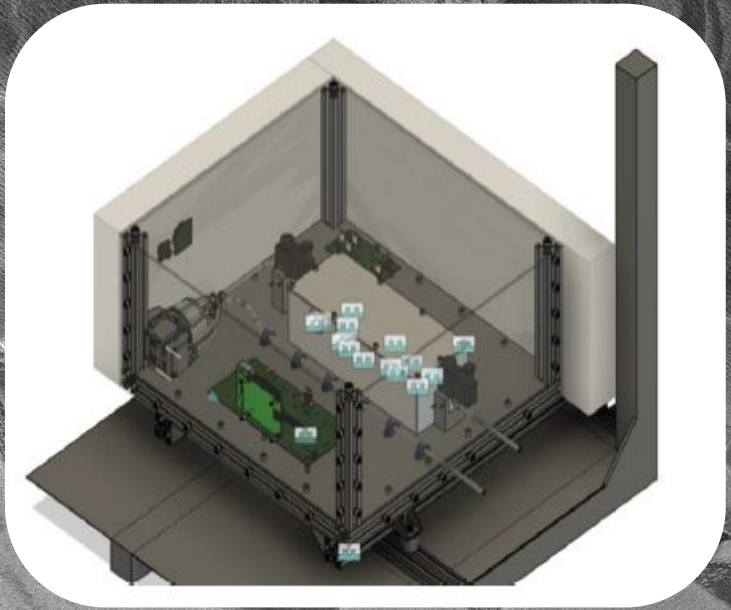
Stage 2

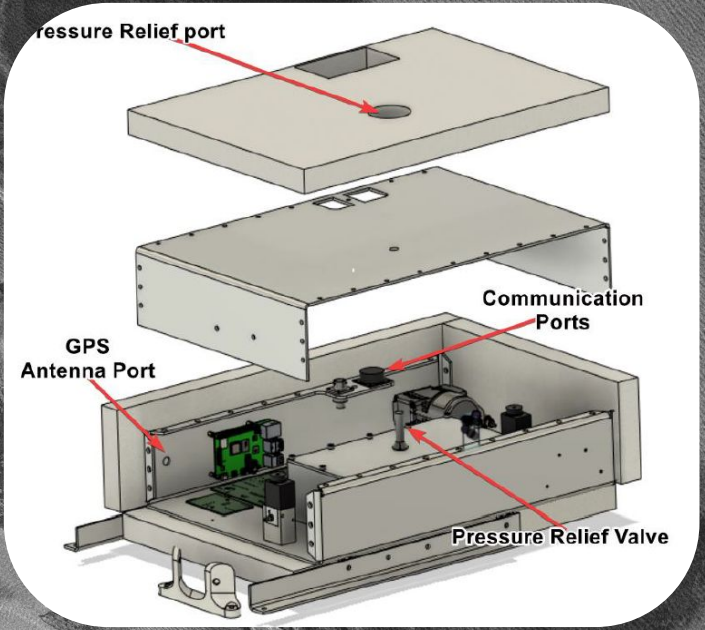


Stage 3

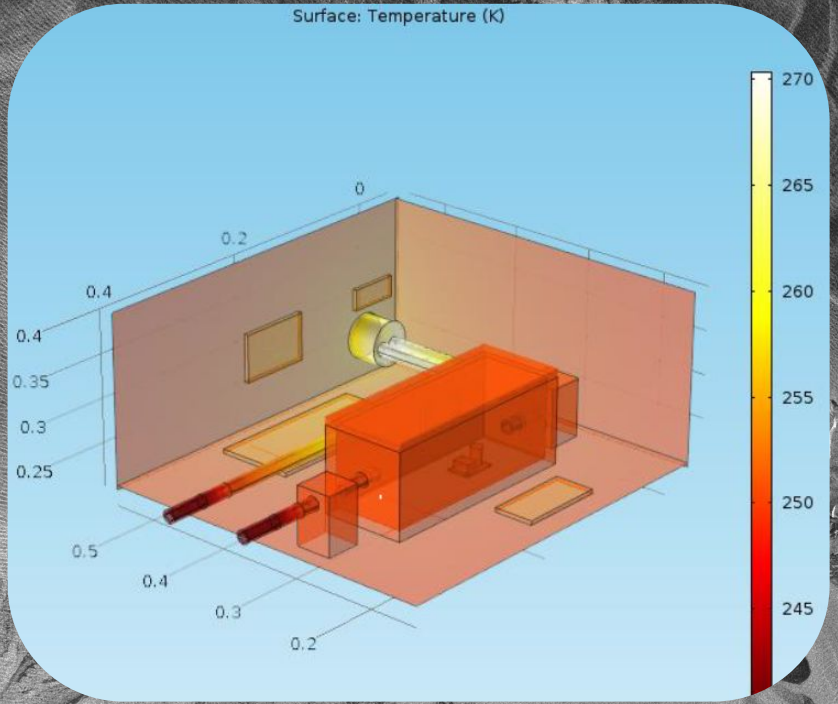


Mechanical Design

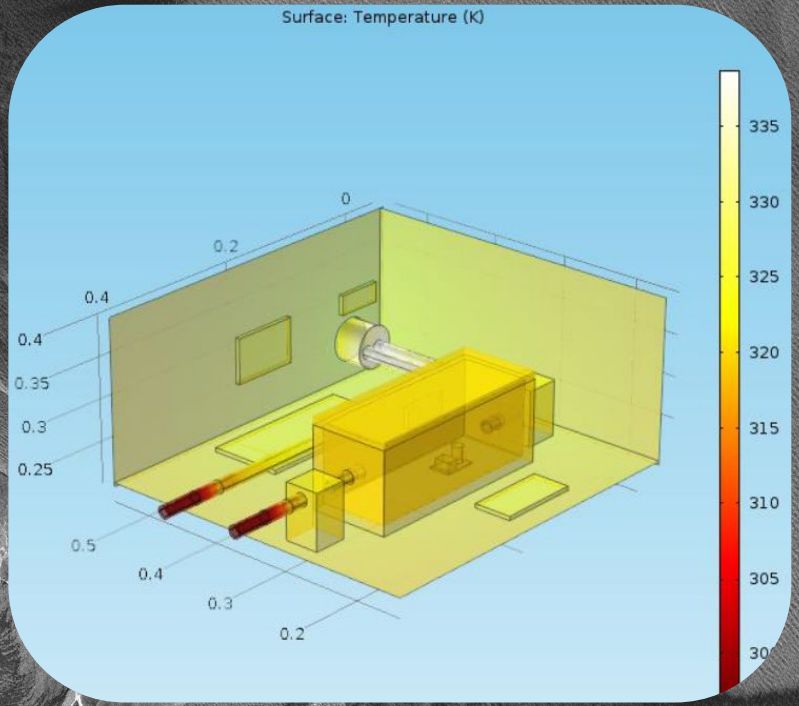




Thermal Design

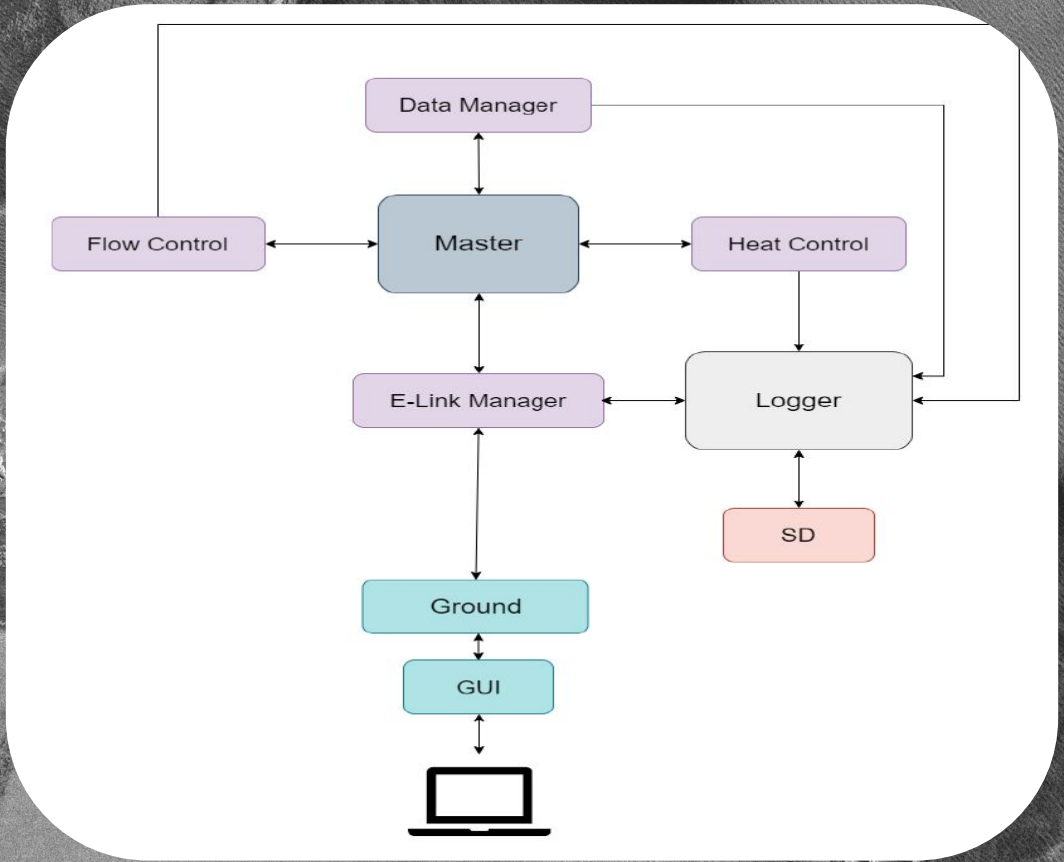


cold worst scenario

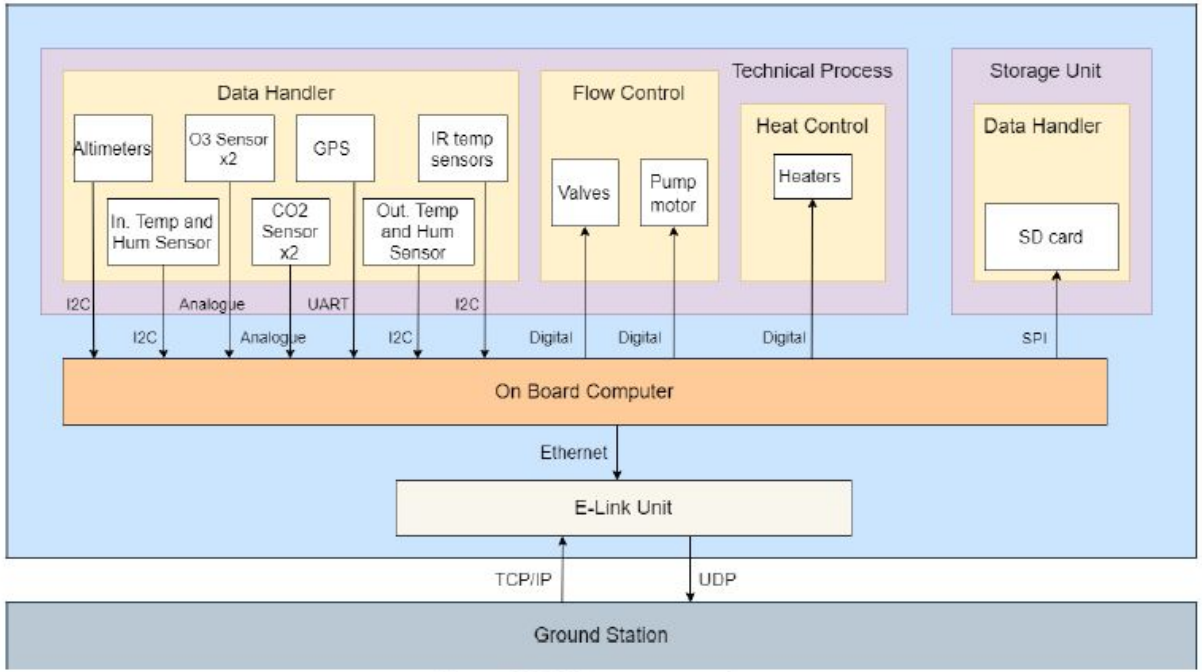


hot worst scenario

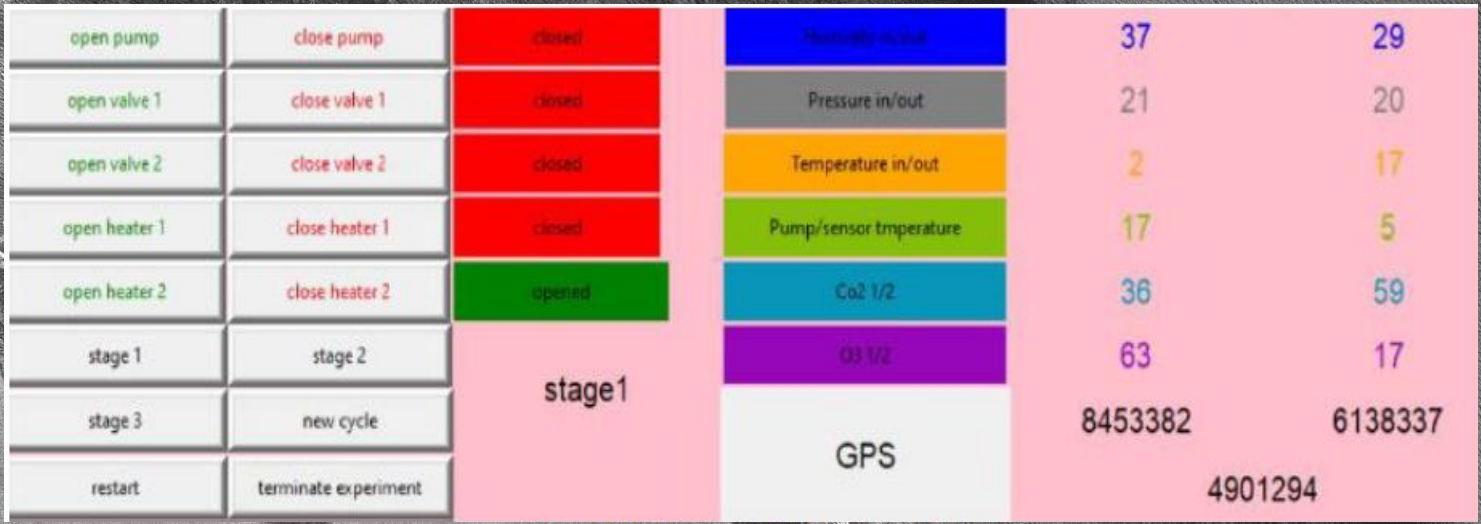
Software Design – Components



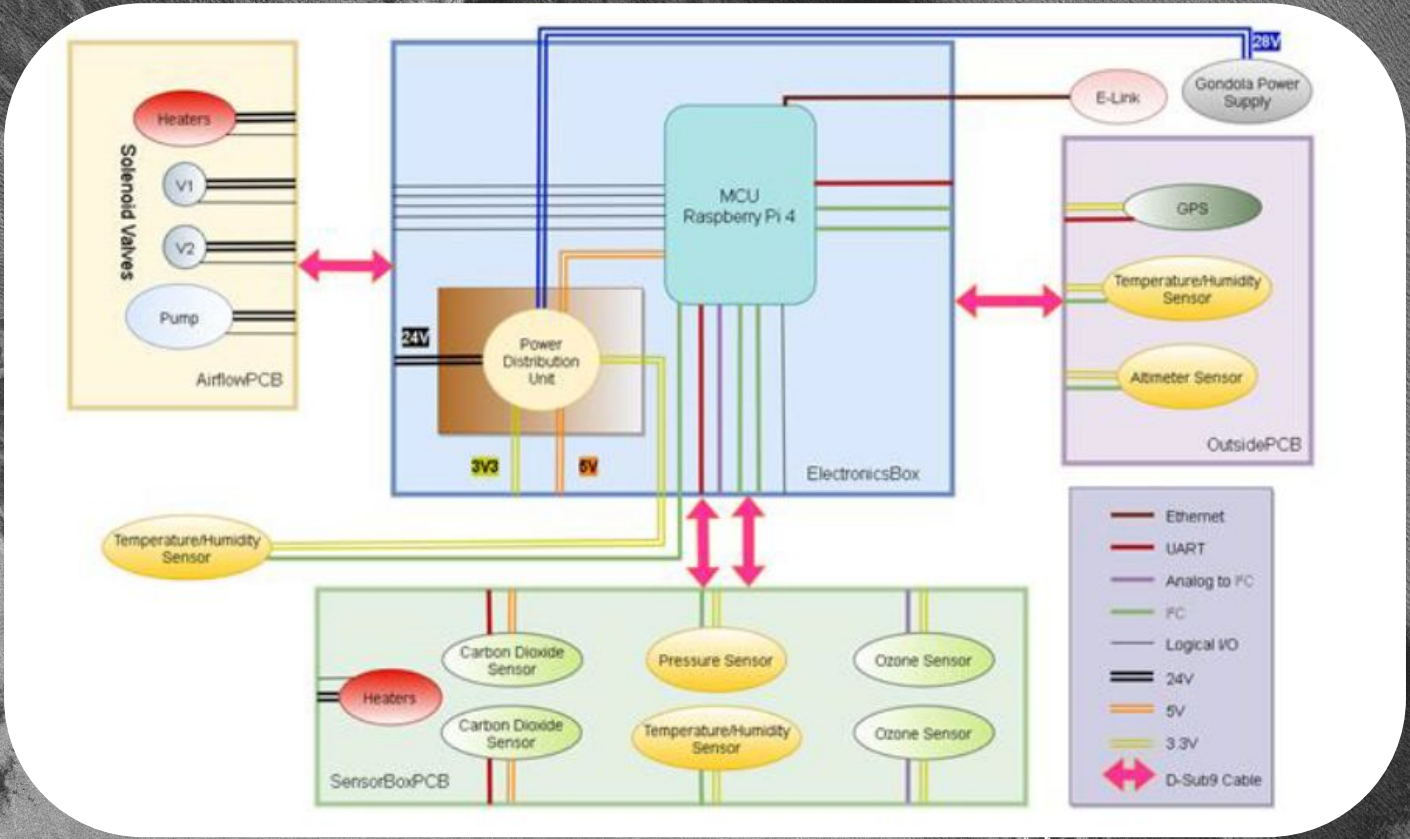
Software Design – Component Interconnection



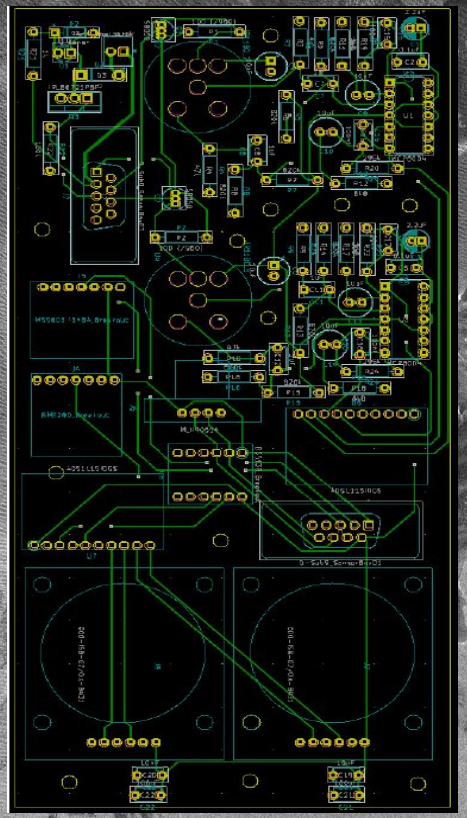
Software Design – Graphical User Interface



Electronics Design



Electronics Design



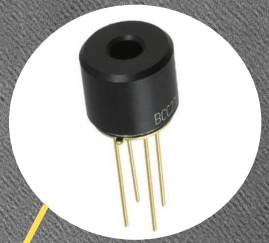


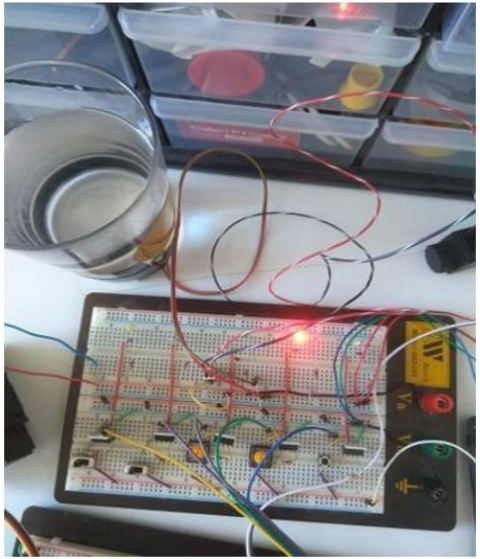
Figure 4-24 0X B431

Experiment Testing

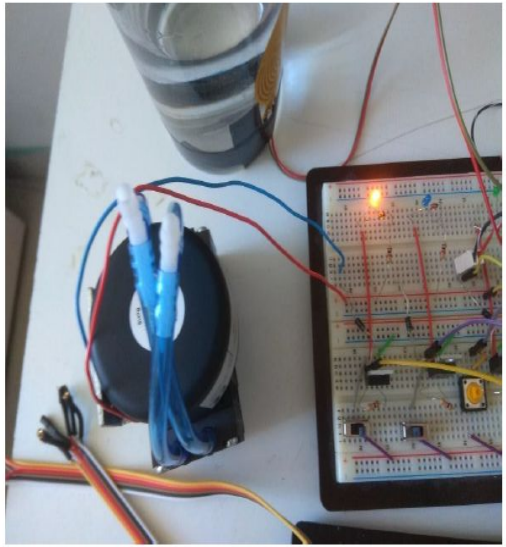
- Electronic components
- PCB function
- PCB-Software units
- Experiment Software
- E-Link
- Vibration
- Thermal
- Vacuum

Electronics-Software Testing - Components Test

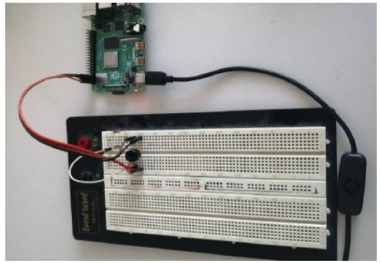
Heater



Pump



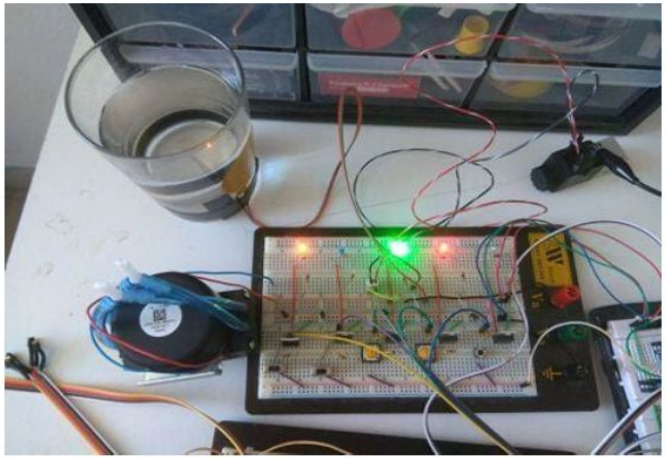
Temperature Sensor



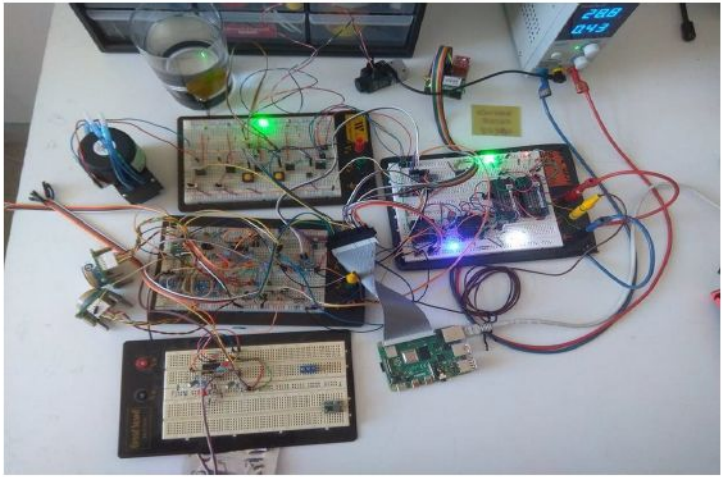
```
pi@raspberrypi:~ $ python MLX.py
ambient temperature=27.39
object1 temperature=29.03
object2 temperature=26.99
ambient temperature=27.41
object1 temperature=29.19
object2 temperature=27.37
ambient temperature=27.37
object1 temperature=29.11
object2 temperature=27.35
ambient temperature=27.33
object1 temperature=29.15
object2 temperature=27.31
ambient temperature=27.37
object1 temperature=29.17
object2 temperature=27.35
ambient temperature=27.33
object1 temperature=29.11
object2 temperature=30.39
ambient temperature=27.33
object1 temperature=29.17
object2 temperature=31.95
ambient temperature=27.37
object1 temperature=29.05
object2 temperature=27.37
```

Electronics–Software Testing – Final Tests

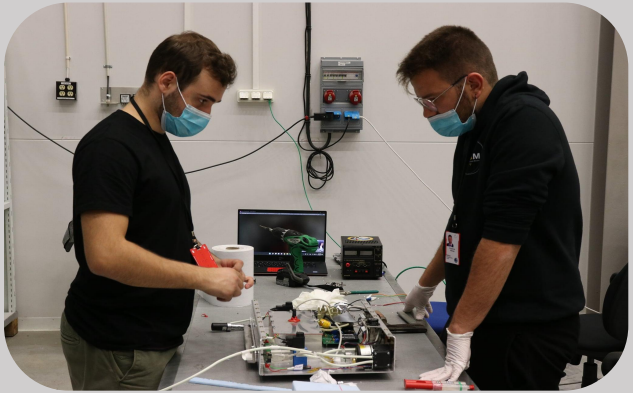
Air Flow

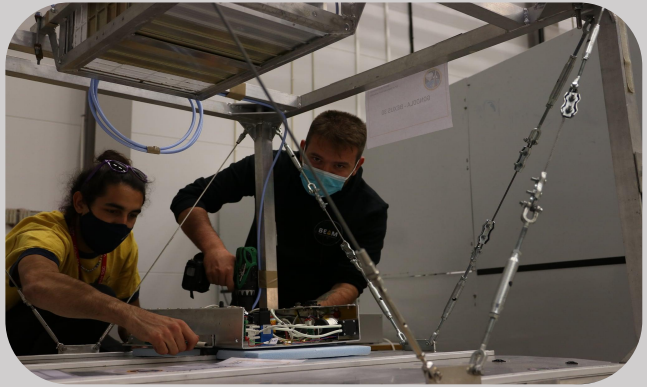


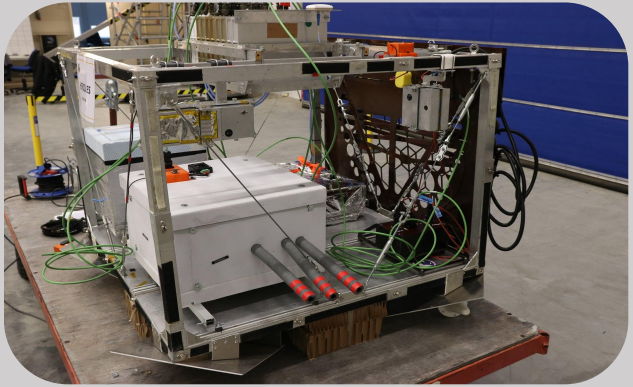
Experiment



Launch Campaign



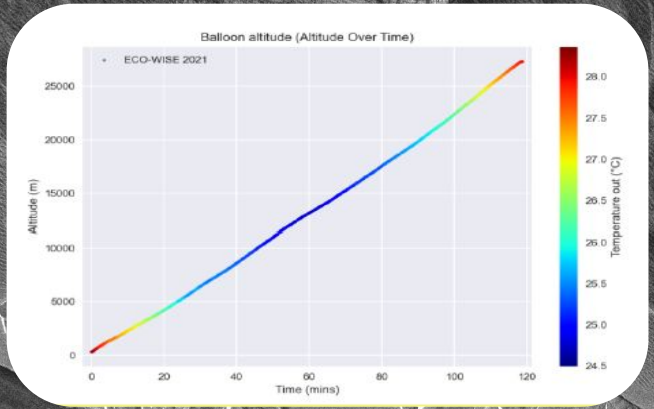


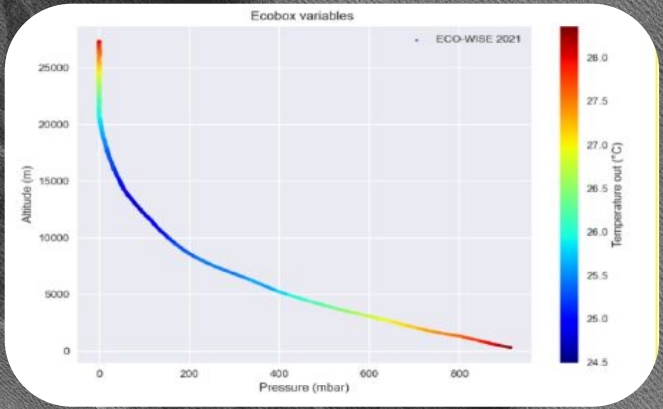


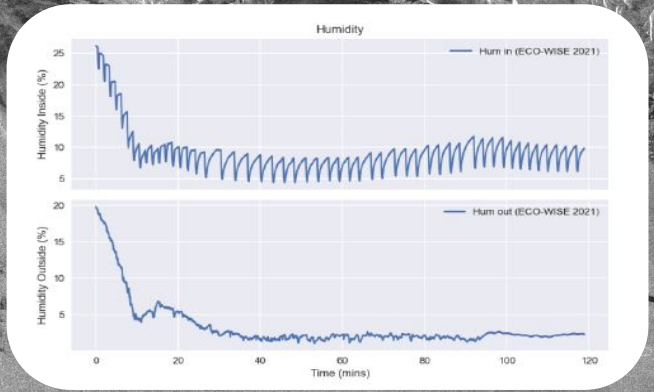
Launch Campaign

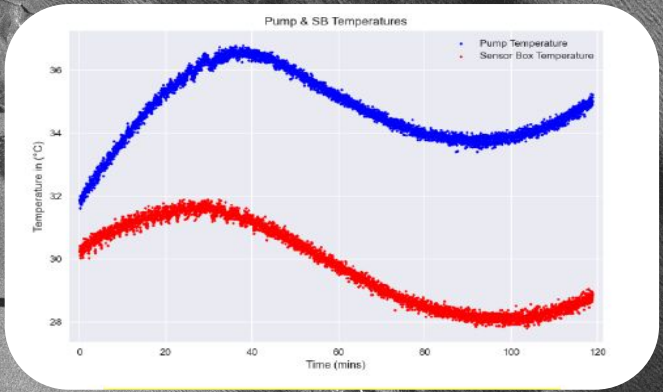
Launch Campaign

Post Data Analysis

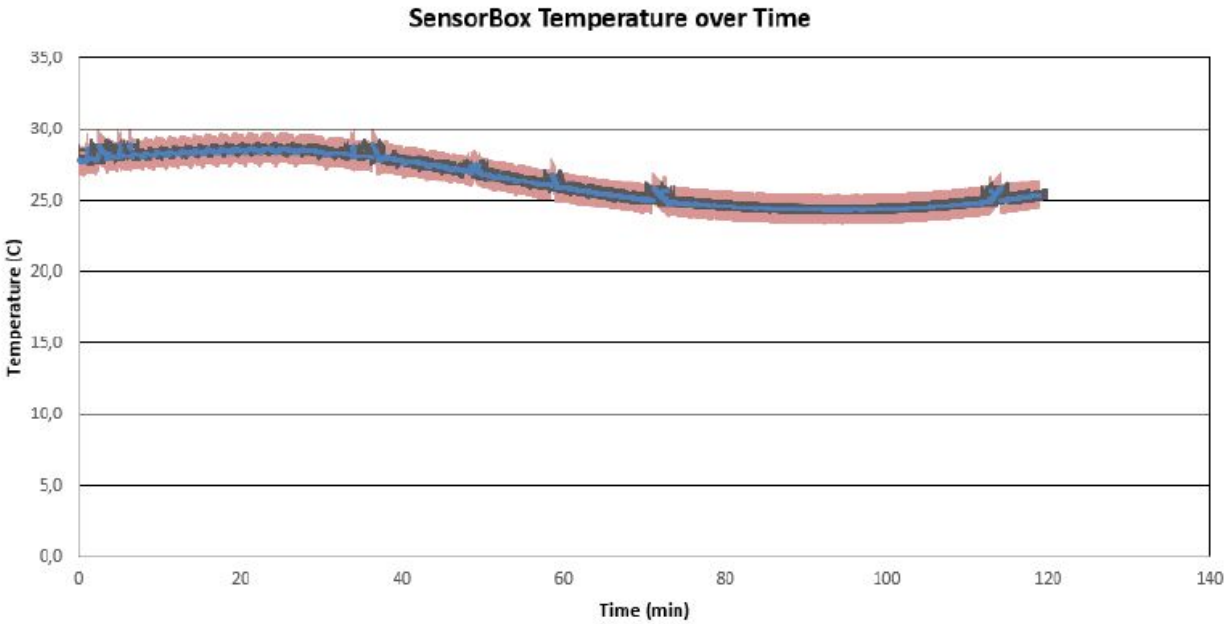




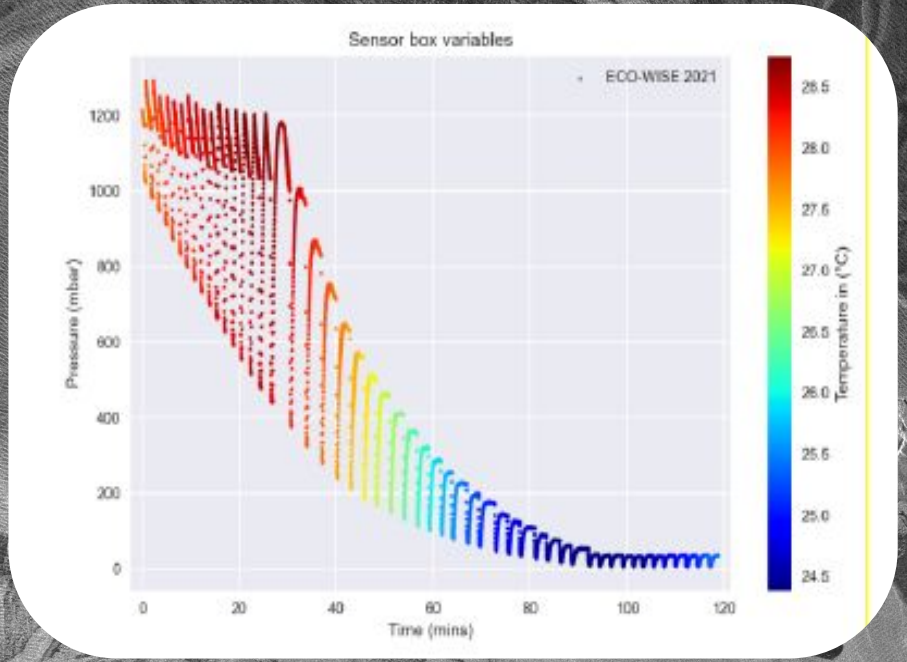


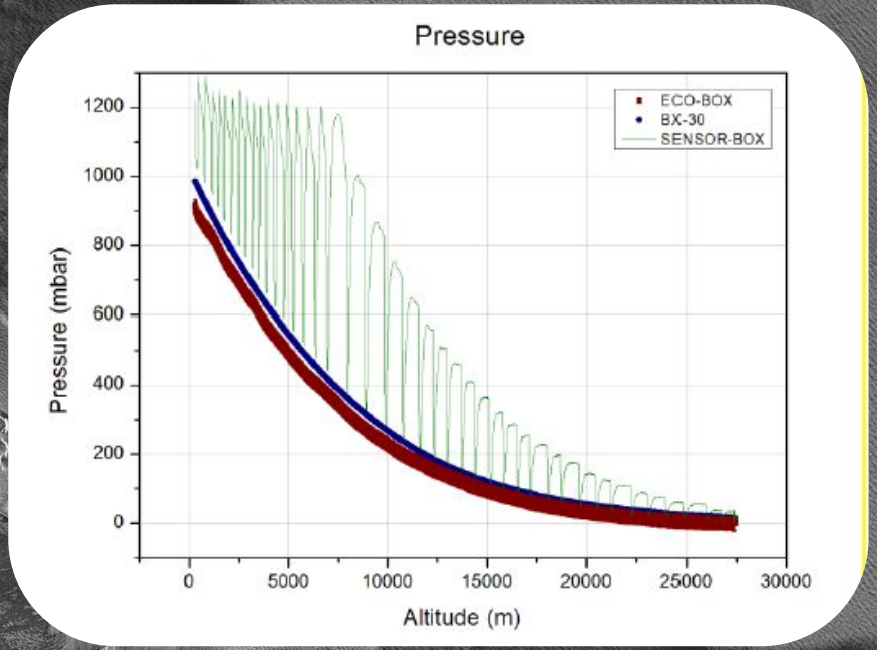


Post Data Analysis

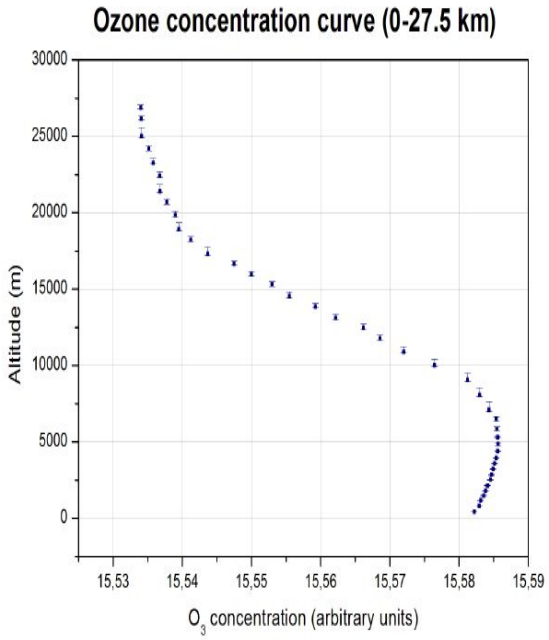


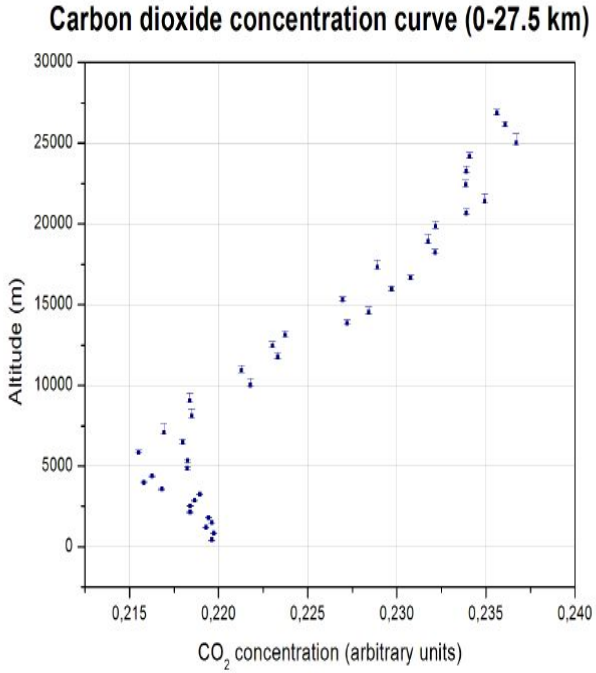
Post Data Analysis





Post Data Analysis





Ecowise Experience

- Technical skills
- System design
- Testing
- Presentations
- Documentation
- Team collaboration

Thank you!

Any Questions?