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SECRETARÍA DE  
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# CLTP 5 - UNISEC

## Final review

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# CanSat mission development

## Content:

1. Introduction.
2. CanSat development: basic mission.
3. Tests: vibration, thermal and parachute deployment.
4. Advance mission: accelerometer, gyro and temperature.
5. First launch.
6. Second launch.
7. Conclusions.

# CanSat mission development

## Introduction

- Version .5 of i-CanSat was introduced to the CLTP5 members.
- Tools and CanSat kit was provided by the instructors.
- The basic mission to acquired GPS data was developed.

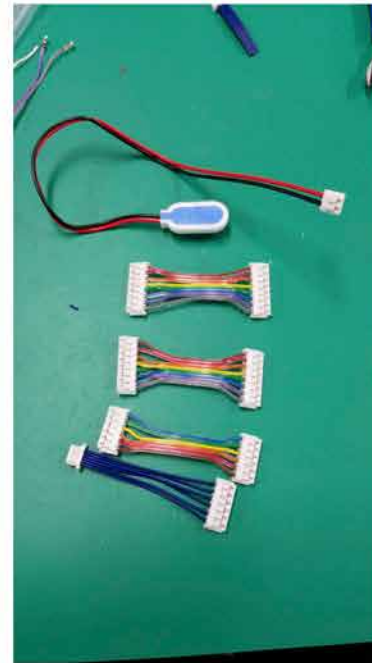
# CanSat mission development

Tool set and i-CanSat kit.



# CanSat mission development

CanSat development: basic mission.

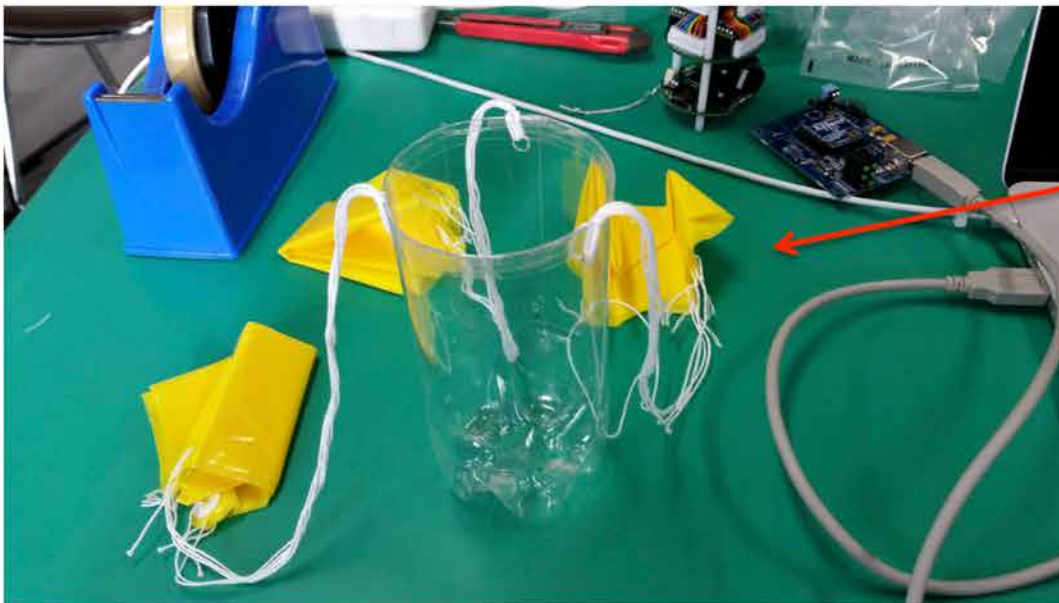




# CanSat mission development

Tests: parachute deployment, GPS test, vibration and thermal.

Parachute assembly → parachute test → GPS test → vibration test → thermal test.



## 1. Parachute assembly:

3 parachute designs were mounted to the PET casing.

# CanSat mission development

Tests: parachute deployment, GPS test, vibration and thermal.

Parachute assembly → parachute test → GPS test → vibration test → thermal test.



## 2. Parachute deployment test:

We tested our designs from the engineering building third floor.



# CanSat mission development

Tests: parachute deployment, GPS test, vibration and thermal.

Parachute assembly → parachute test → **GPS test** → vibration test → thermal test.



### 3. GPS signal receiving test:

We tested outside the receiving signal of GPS.

Up to 8 satellites were detected.

# CanSat mission development

Tests: parachute deployment, GPS test, vibration and thermal.

Parachute assembly → parachute test → GPS test → **vibration test** → thermal test.



## 4. Vibration test:

We tested our cansat in the vibration facilities.

Sinusoidal, random, shock, random and shock were performed (in this order).

Data was received while Cansat was tested.

# CanSat mission development

Tests: parachute deployment, GPS test, vibration and thermal.

Parachute assembly → parachute test → GPS test → vibration test → **thermal test.**



## 5. Thermal test:

We tested our cansat in the thermal equipment.

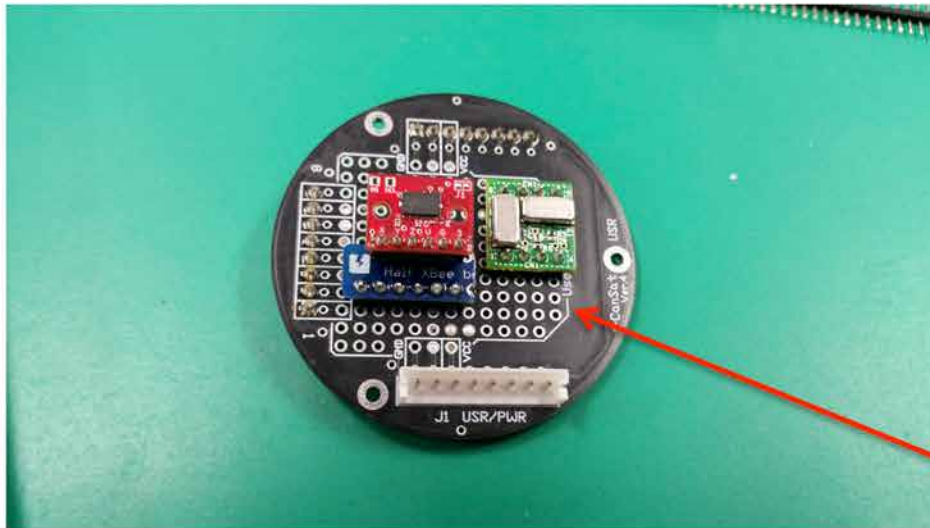
Akabira ambient temperature cycle was reproduced in the lab.

Data was received while Cansat was tested and until battery run out.



# CanSat mission development

Advance mission: accelerometer, gyro and temperature sensors.



## Accelerometer and gyroscope assembly:

For the advance mission I attached accelerometer, gyroscope and temperature sensors to the user board.

Accelerometer and gyroscope are shown mounted on the user board.





# CanSat mission development

Paper rocket assembly.



# CanSat mission development

First launch.



**The first launching was successful:**

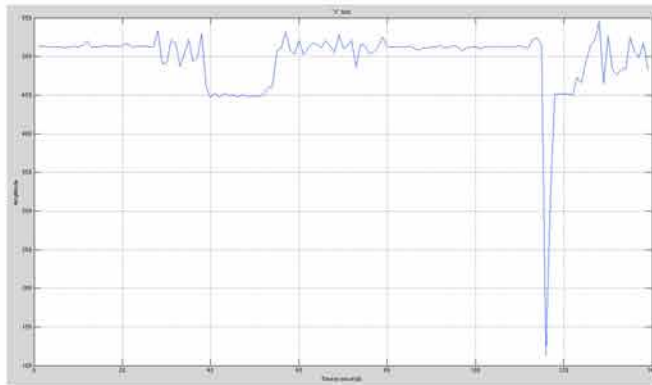
The Cansat sent data from GPS, accelerometer, gyroscope and temperature sensors.



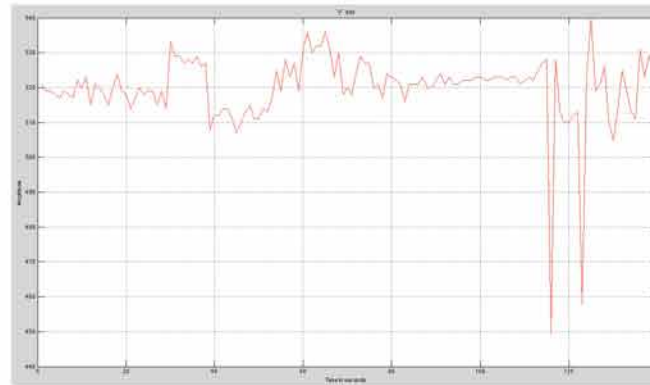
# CanSat mission development

## First launch.

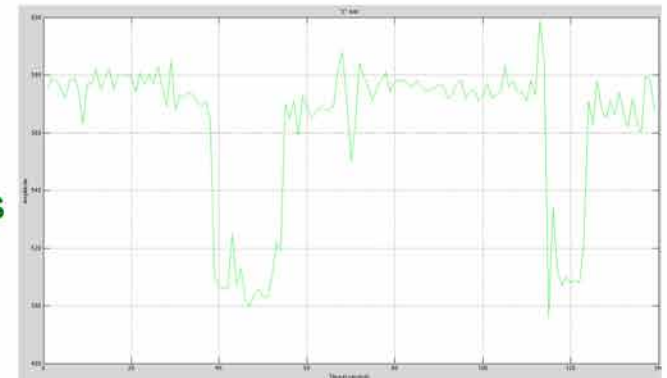
Data from accelerometer and gyroscope acquired from the first launch.



Accelerometer x axis



Accelerometer y axis

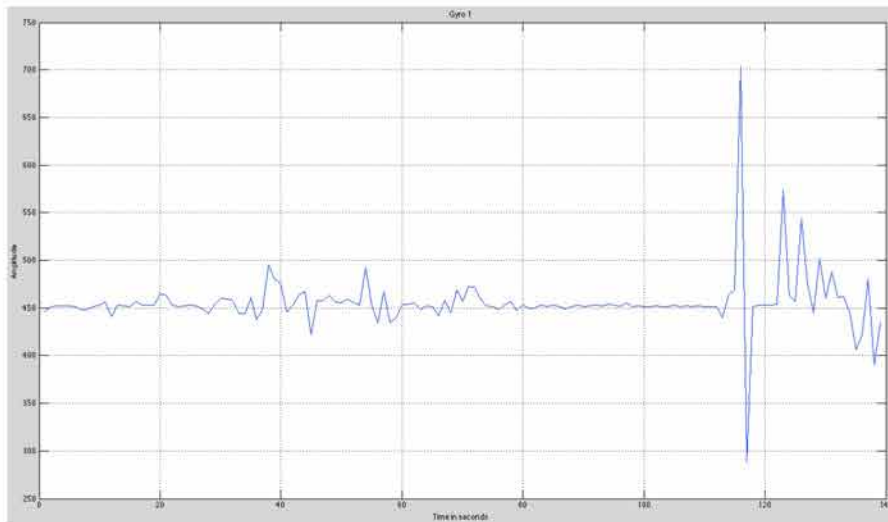


Accelerometer z axis

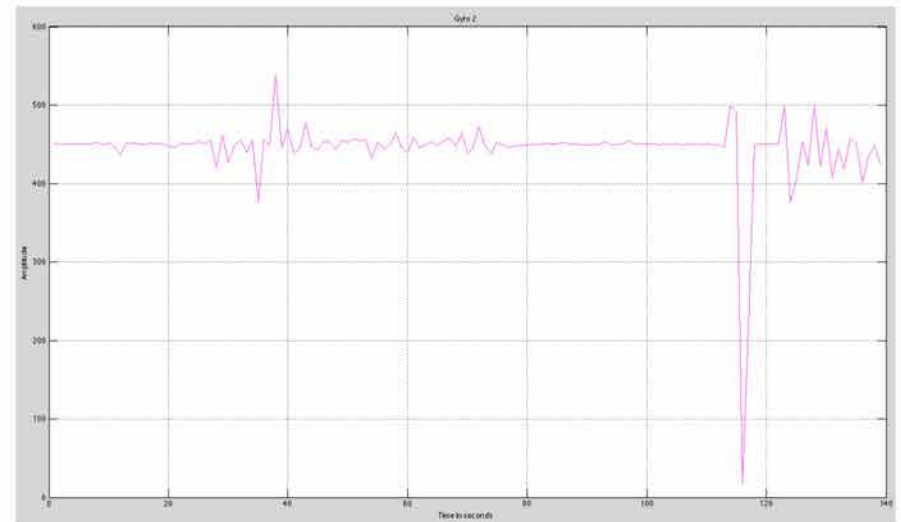
# CanSat mission development

## First launch.

Data from accelerometer and gyroscope acquired from the first launch.



**Gyro 1 data**

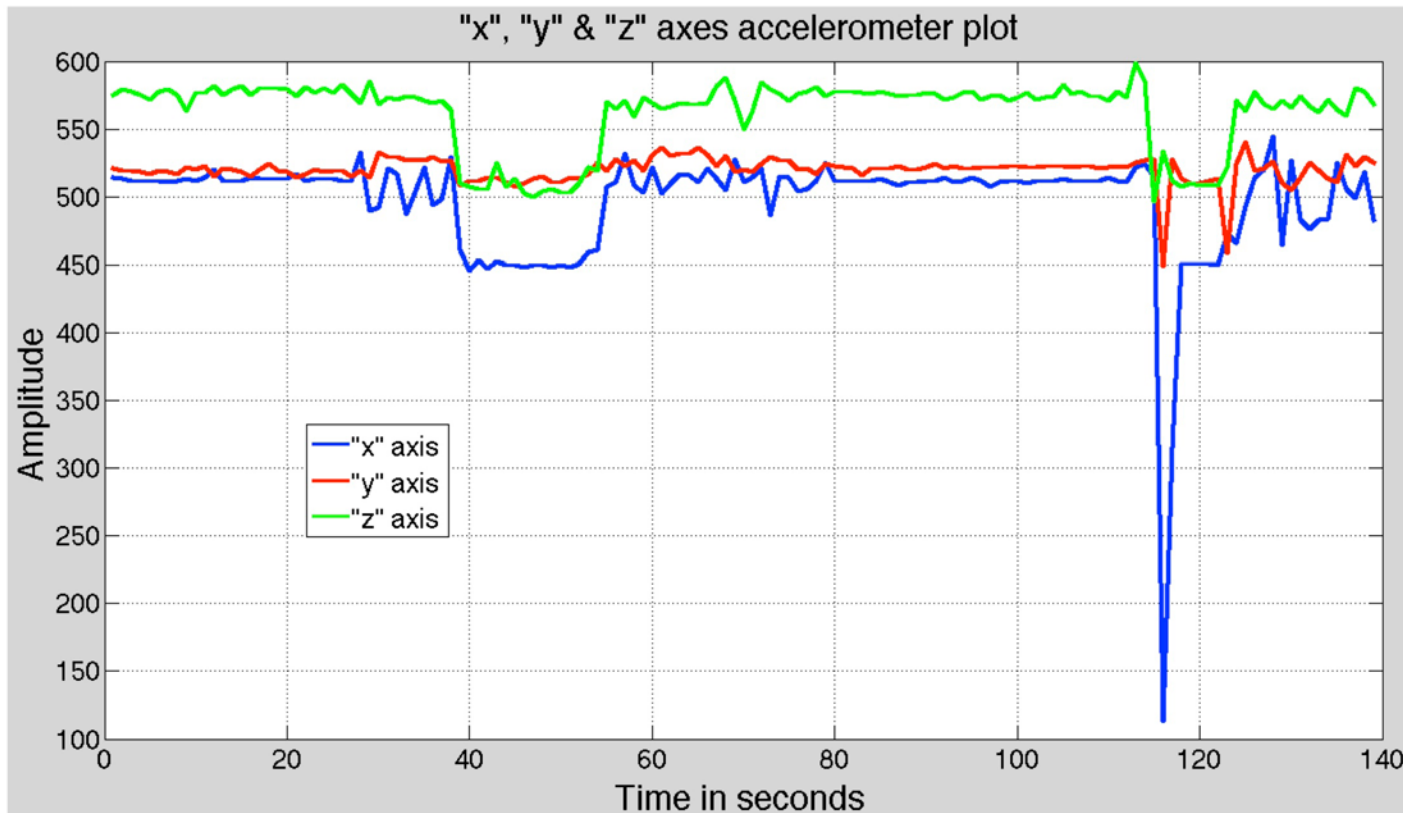


**Gyro 2 data**

# CanSat mission development

## First launch.

Data from accelerometer (first launch).



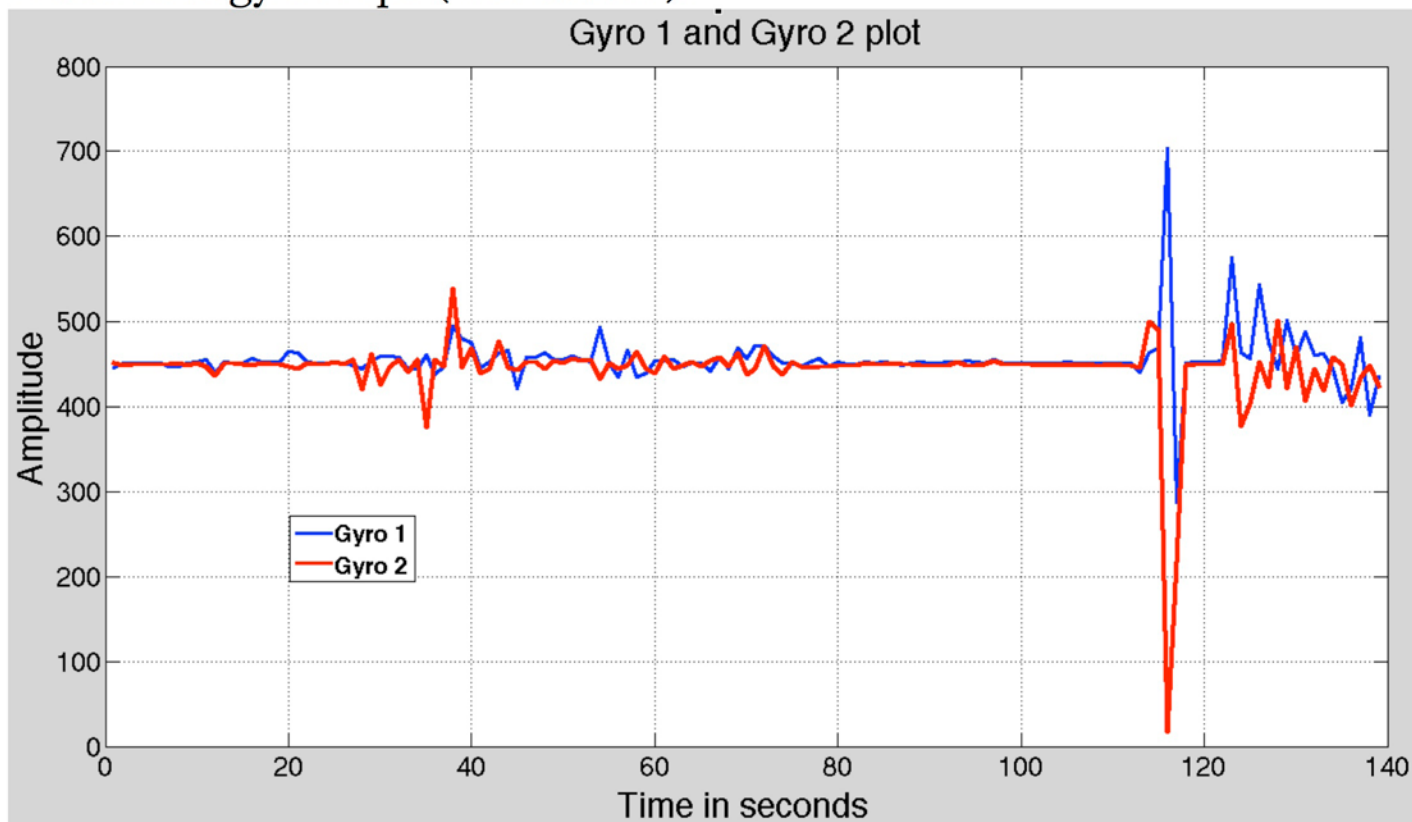
**Accelerometer data  
"x", "y" & "z" axes.**



# CanSat mission development

## First launch.

Data from gyroscope (first launch).



**Gyroscope data  
Gyro 1 & Gyro 2.**

# CanSat mission development

## Second launch.



**The second launch was successful:**

The Cansat sent data from GPS, accelerometer, gyroscope and temperature sensors.



# CanSat mission development

Second launch.

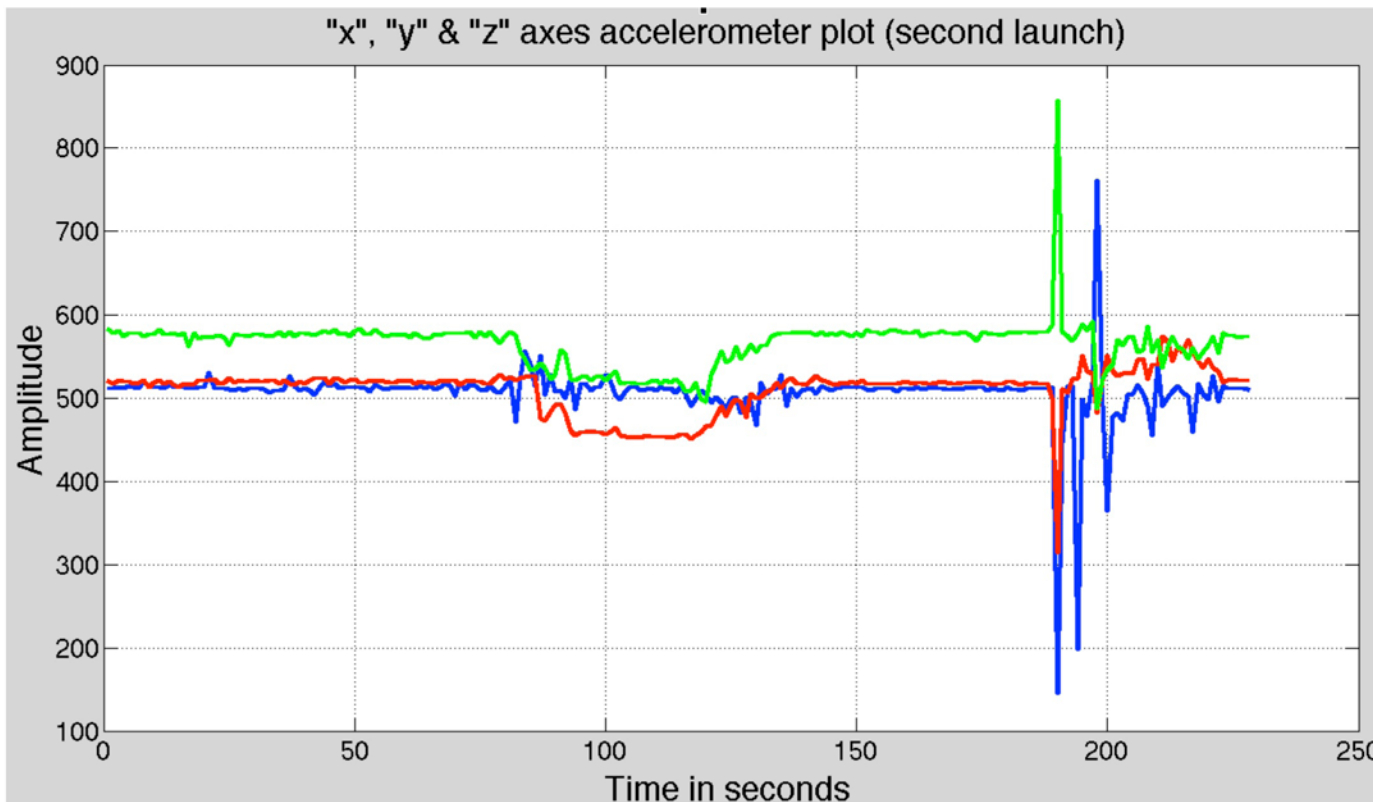
Camera pictures.



# CanSat mission development

## Second launch.

Data from accelerometer (second launch).

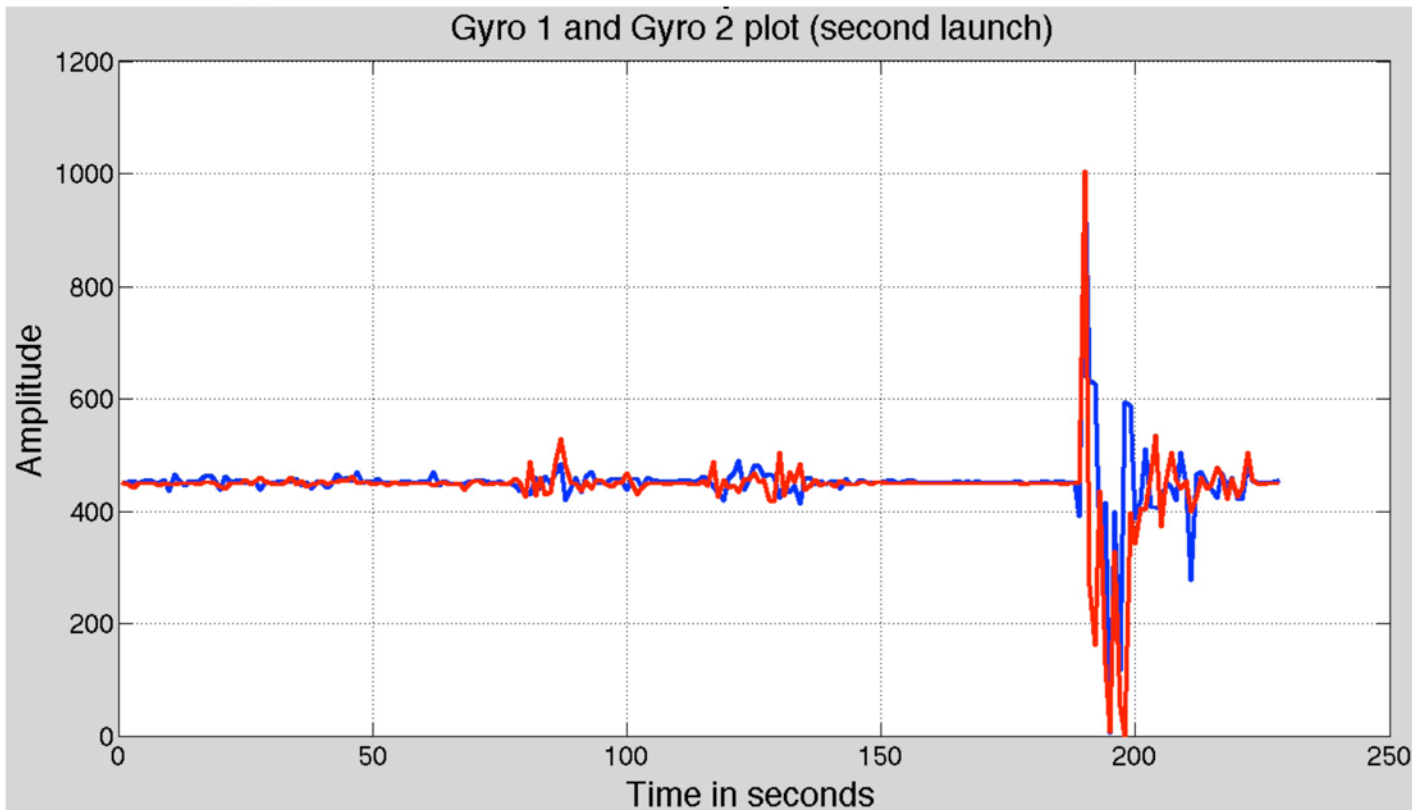


**Accelerometer data  
"x", "y" & "z" axes.**

# CanSat mission development

## Second launch.

Data from gyroscope (first launch).



**Gyroscope data  
Gyro 1 & Gyro 2.**



# CanSat mission development

## Conclusions.

- i-CanSat was successfully tested.
- Advanced mission was completed (only more work with converting temperature sensor is needed as well as soldering).
- Papercraft rocket was successfully completed and tested in two launches.
- Data from Cansat was aquired in the ground station.
- I am starting 4 CanSat programs in Mexico in the next weeks!

# Thanks CLTP5





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