

Result of ARISS2009 in Akita Univ

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The Univ. of Akita Space Student Project

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Introduction of our Cansat

- We developed three Cansats with the same feature.
- The purpose of three Cansat is to measure an air pattern and a flight state.
- All of three Cansats equip a parachute, which has different fall speed (3.5m/s , 4.5m/s , 5.5m/s).
- We predict vertical wind velocity distribution from the difference in the fall speed (our advanced success).

System Diagram of Cansat

Features

- Sampling rate of GPS data is 5Hz.
- Cansats have three types of sensor as following, gyro sensor, acceleration sensor and magnetic sensor, and all sensors have 3 axis and 12bit resolution.
- We use Micro SD card as a recording medium of sensor data.

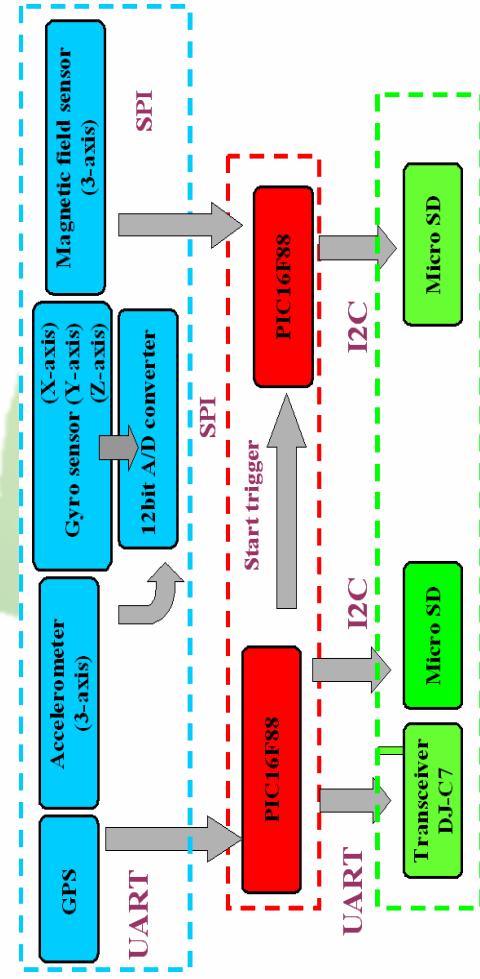


Fig. 1 system Diagram of Cansat

Structure & Power

- Size
60 mm × 180 mm
- Body
GFRP (Glass Fiber
Reinforced Plastics)
- Battery
Alkali battery(9V,400mAh)
- Voltage transfer
DCDC(5.0V – Step down)
(3.3V – Step down)

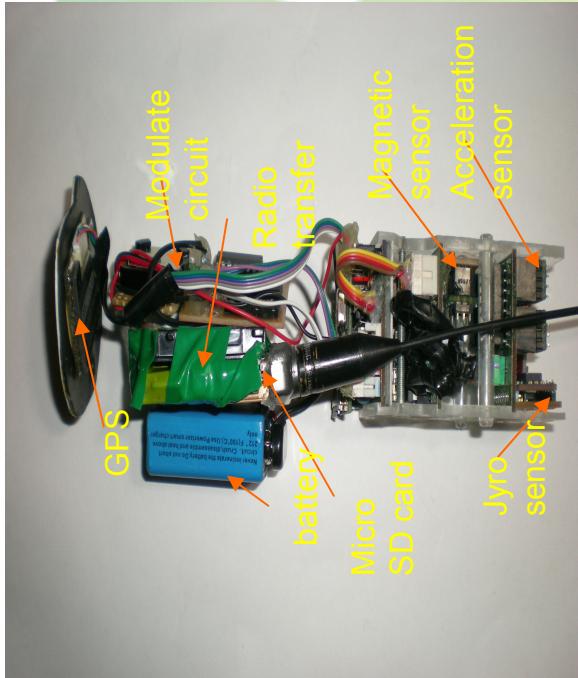


Fig.2 The Inside of Canasat



Fig.3 The Outward of cansat

Results 1

- We succeeded in recovery of all the cansat at 1st and 2nd flight.

- Table 1 showed the recorded state of GPS and sensors data

Success Rate
42%...

Fall speed	Sensors	GPS	1st Flight		2nd Flight		
			Fall speed	Sensors	Fall speed	Sensors	GPS
3.5m/s	○	×	3.5m/s	×	3.5m/s	×	×
4.5m/s	×	○	4.5m/s	○	4.5m/s	×	×
5.5m/s	○	○	5.5m/s	○	5.5m/s	○	×

Results2 (GPS data)

- Fig.4 shows GPS data (5Hz) of Canasat with 4.5m/s fall speed.

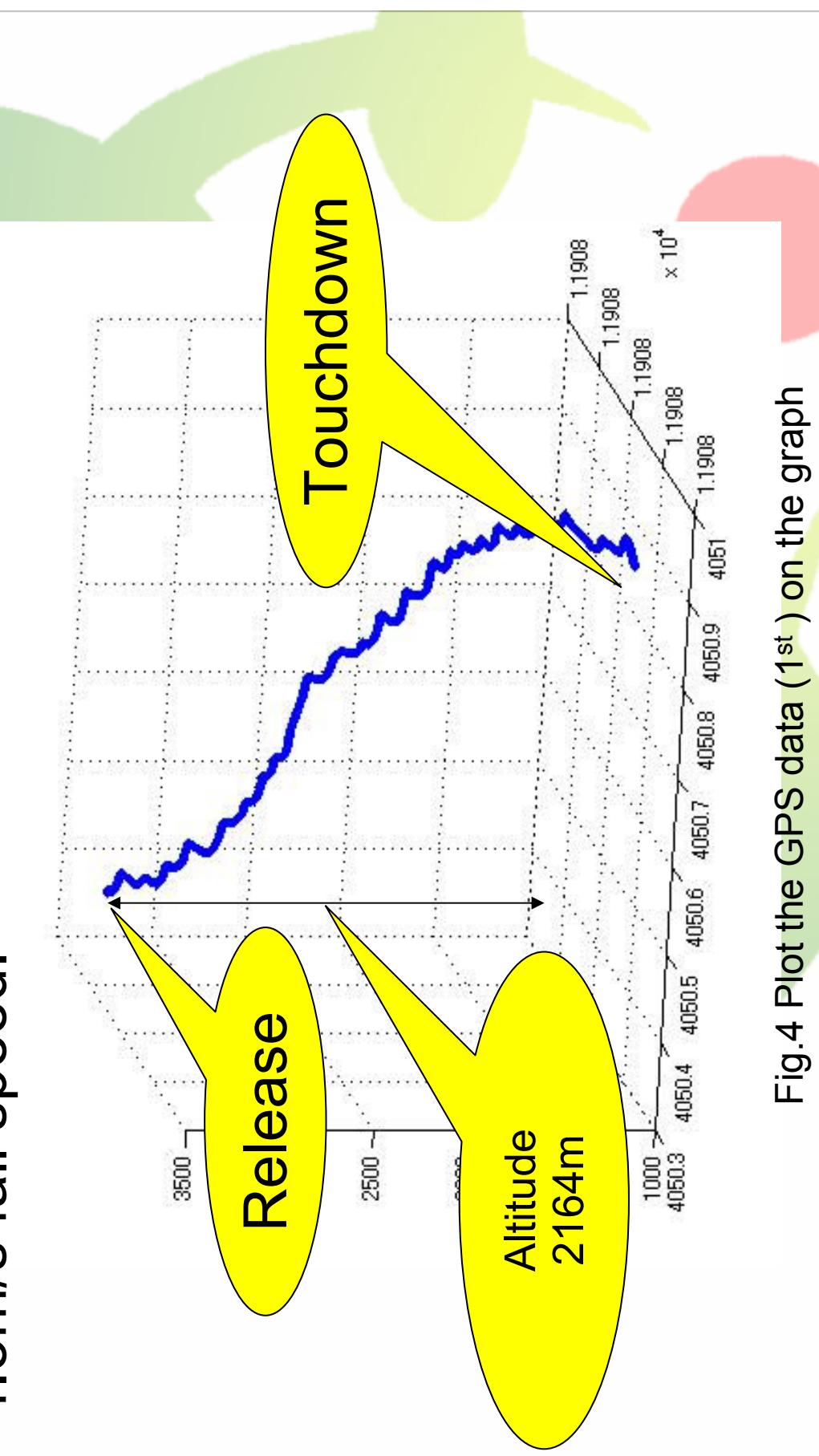


Fig.4 Plot the GPS data (1st) on the graph

Results3 (Acceleration sensor)

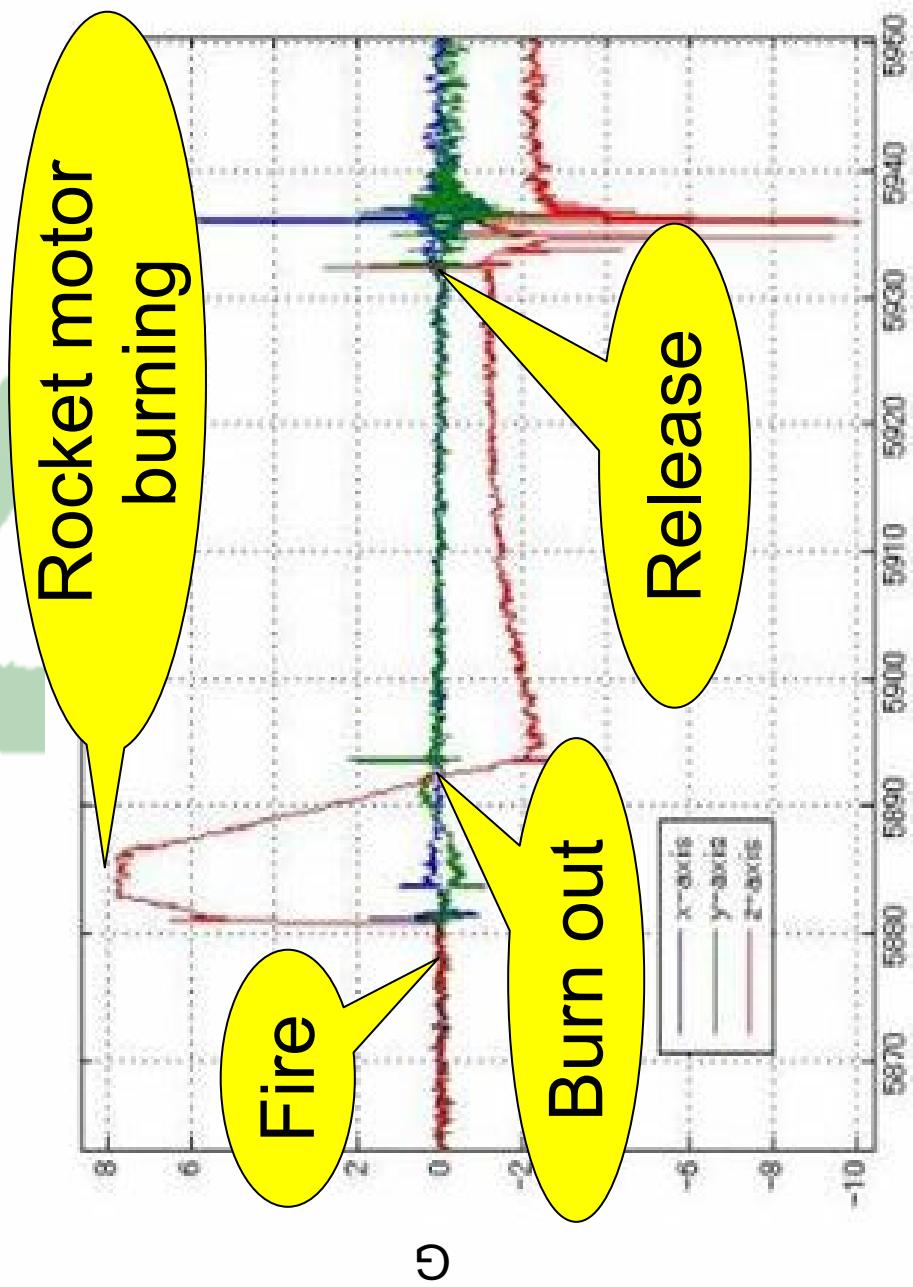


Fig.5 Plot the acceleration sensor data (1st) on the graph

Results4 (Magnetic sensor)

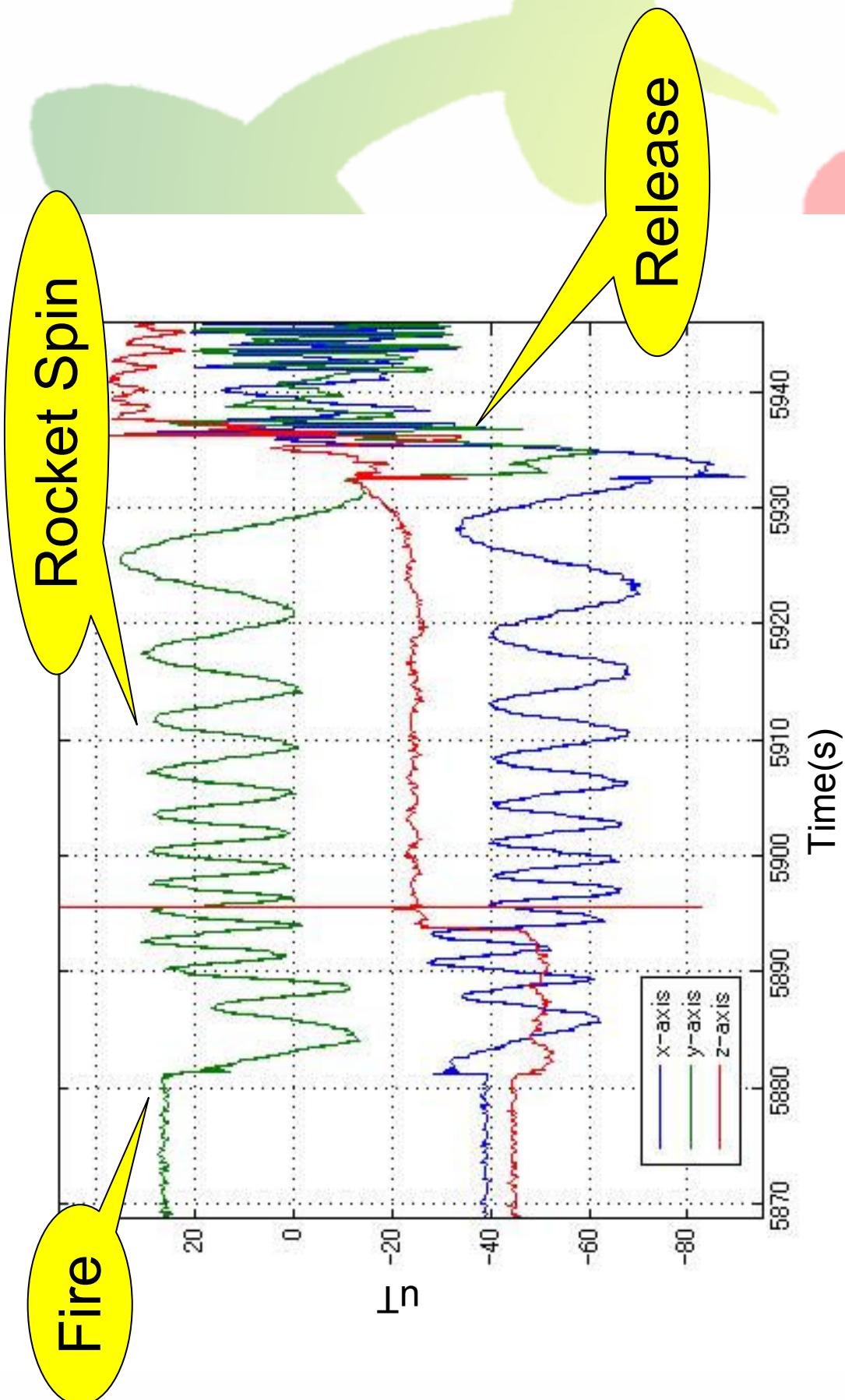


Fig.6 Plot the magnetic sensor data (1st) on the graph

Results5 (Gyro sensor)

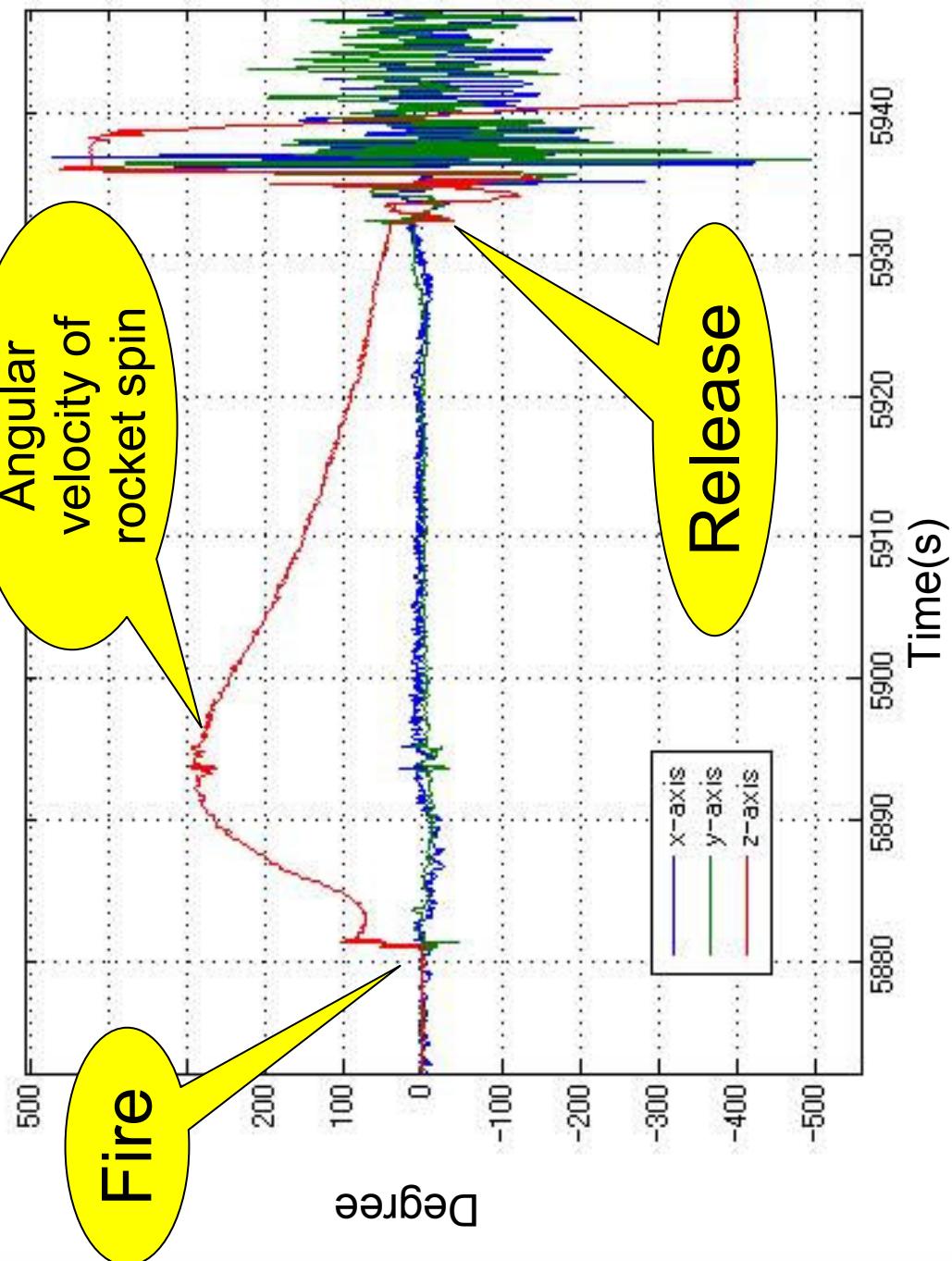


Fig.7 Plot the gyro sensor data (1st) on the graph

Thank you for launching



2nd Flight Mr. Charlie



1st Flight Mr. Jonathan

Summary

- We developed three Cansats with the same feature.
- However, the success rate of the data collection is 33%.
- It is hard to predict vertical wind velocity distribution (our advanced success) because the success rate of the data collection is 33%.
- However, we will try analysis, in order to attain advanced success.
- Additionally, we have to improve our manufacturing skill
 - and the success rate of the data collection.