Progress Report on Rocket Launching "FROM THE EARTH"

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Abstracts

1. What's "FROM THE EARTH"?
2. The schedule of this year
3. Report of Hybrid Rocket projects
4. Report of CanSat projects
5. Report of Social action works

Group photo in this spring

Our Rocket launched in this summer

What's "FROM THE EARTH"?

Regular activity

- To make and launch model rockets and hybrid rockets
- To develop Cansats
- To do social action works

hybrid rockets

Member

Total 122	
Junior	30
Sophomore	32
Freshmen and women	60

Social action work

What's "FROM THE EARTH"?

Height records of F.T.E. Hybrid Rocket projects

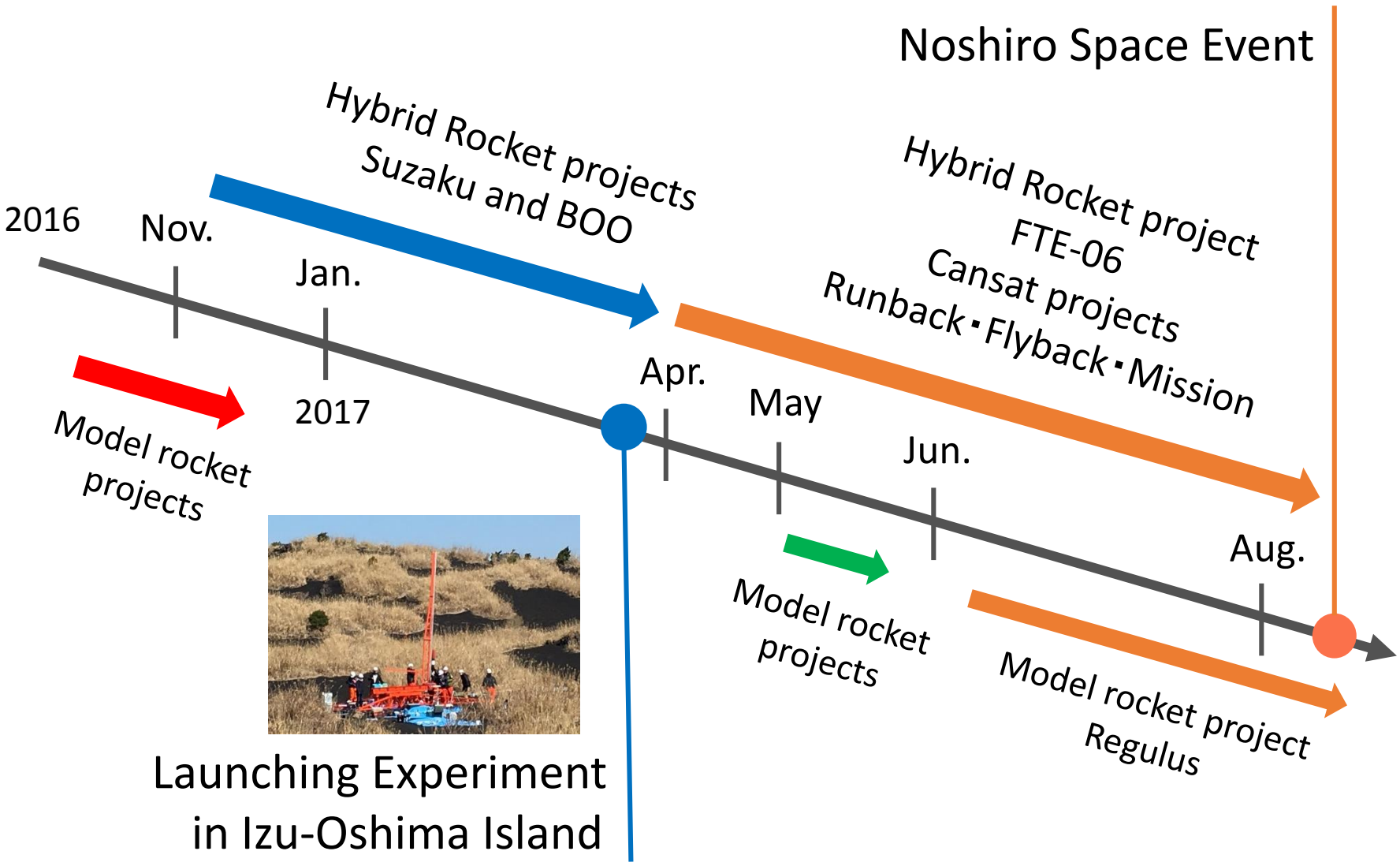
2012	FTE-01	280 m
2013	FTE-02	491 m
2014	FTE-03	no data
2015	FTE-04	no data
2016	Tsubame	924 m

Our goals this year

To reach 1km
To get much flight data

Launched in Noshiro (2016)

The schedule of this year



Hybrid Rocket project BOO

Goals

To reach 1500m
To recover without any damage

Detail

Length	1700 mm
Weight (before fuel filled)	3.7 kg
Outside diameter	116 mm
Motor	Hyper TEK K-240 (Polybutadiene, N_2O)

Overview

Hybrid Rocket project BOO

Result

Launched date:2017/3/23
Place : Izu-Oshima Island
Height : no data

Flying

We launched the rocket by ourselves. However, its release mechanism was miss-operated during flying and the parachute didn't work.

We couldn't collect enough data.

After BOO was found

Hybrid Rocket project Suzaku

From The Earth since2011

Goals

To launch a reuse rocket
To use new electrical equipment

Detail

Length	1480 mm
Weight (before fuel filled)	6.1 kg
Outside diameter	144 mm
Motor	Hyper TEK J-250 (Polybutadiene, N_2O)

Overview

Hybrid Rocket project Suzaku

Result

Launched date:2017/3/23
Place : Izu-Oshima Island
Height : no data

We launched the rocket by ourselves However, its release mechanism was miss-operated and the parachute was not released.

We couldn't collect enough data.

Lifting off

After Suzaku was found

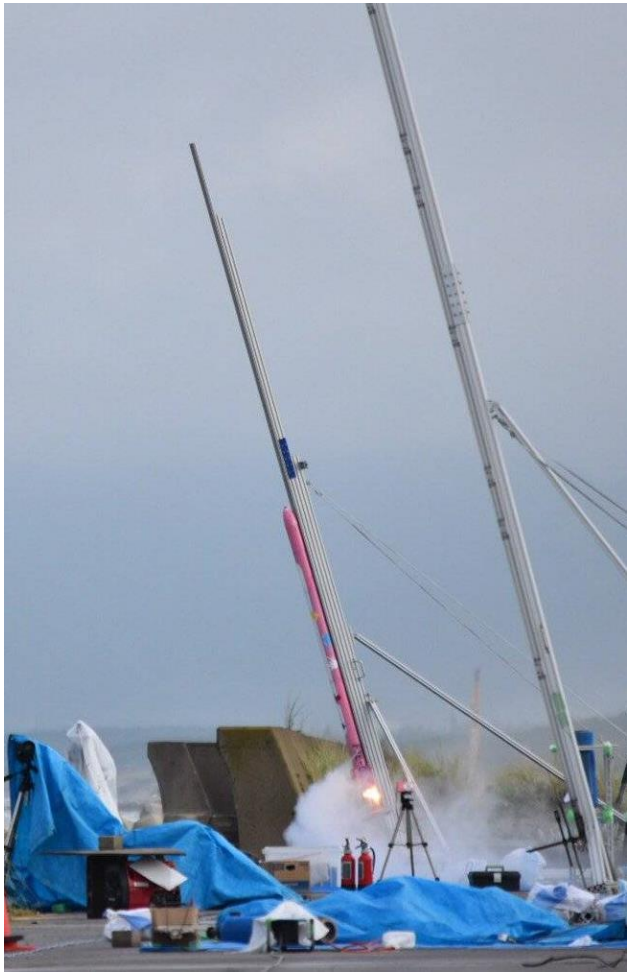
Hybrid Rocket project FTE-06

Goals

To reach 1km
To get much flight data

Detail

Length	2180 mm
Weight (before fuel filled)	4.4 kg
Outside diameter	91 mm
Motor	Hyper TEK K-240 (Polybutadiene, N_2O)



Overview

Hybrid Rocket project FTE-06

Result

Launched date:2017/8/23
Place : Noshiro, Akita
Height : 1123 m

We launched the rocket by ourselves. Its parachute separated from the main body because of opening shock of the parachute, So it fell without slowing down.

However, it reached 1km high and We could get enough data.

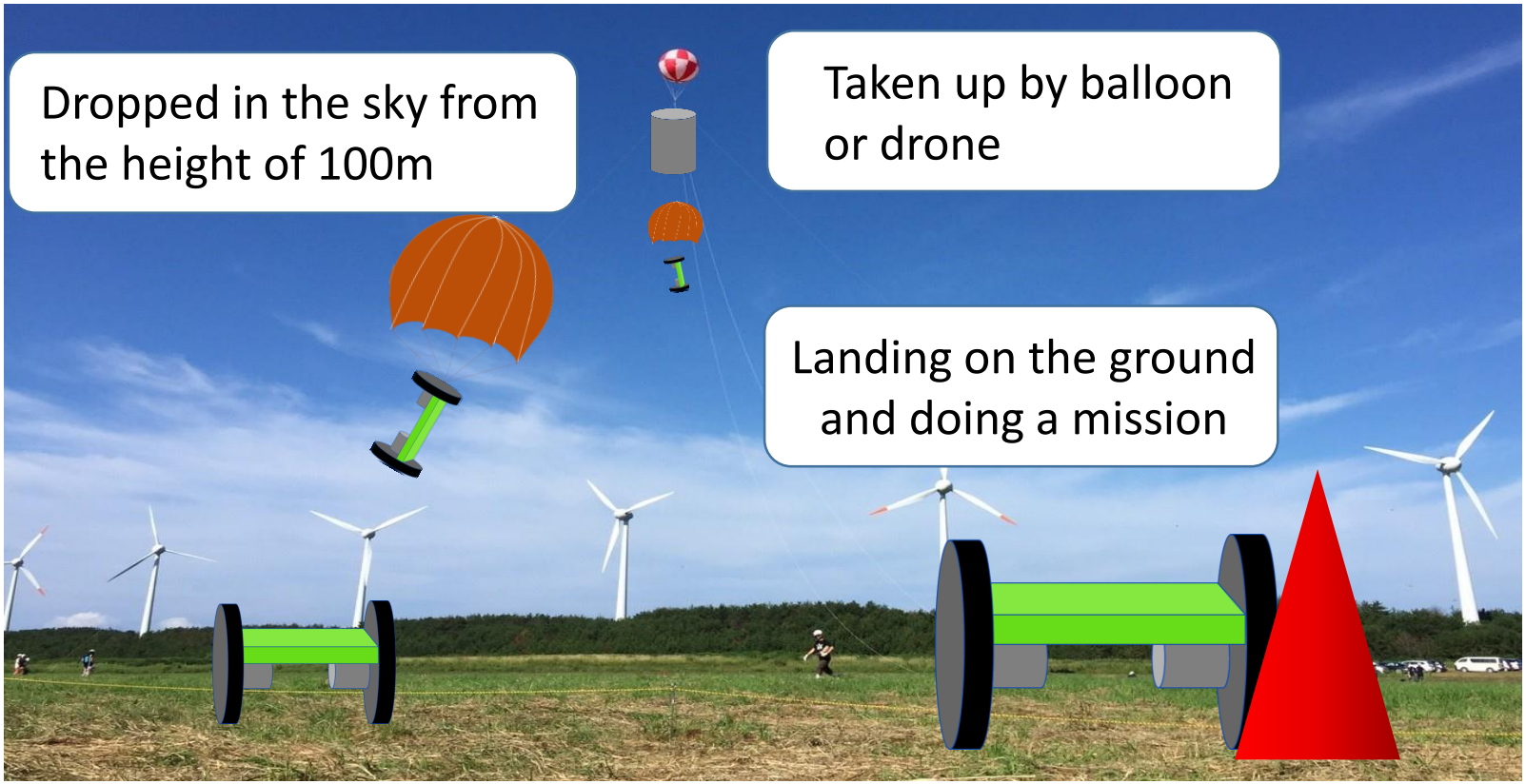
Flying

After it FTE-06 was found

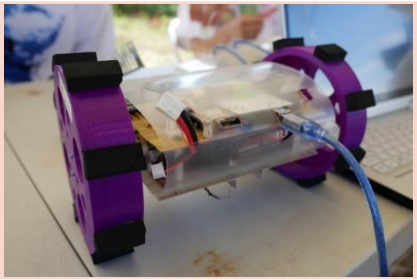
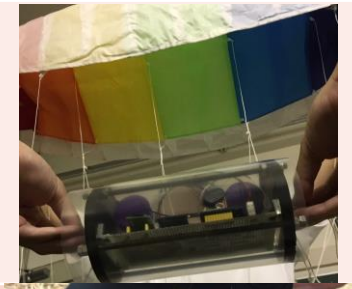
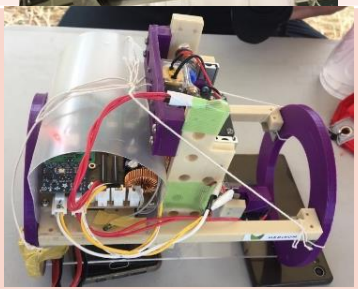
Cansat projects

What is a Cansat?

Cansat is a simulated satellite of juice cans size. It performs data acquisition and communication experiments while it is falling to the ground and moving on the ground.



Cansat projects

Project	Goal	Result	Overview
Runback	To reach to a destination	Damage on one side of the tire because of landing shock	
Flyback	To reach to a destination using a parafoil	It was influenced by strong wind and did not reach to a destination	
Misson	To dig a ground using a drill and plant seeds	Its drill operated but did not dig the ground because of the body direction	

Social action works

We held 9 events in this year.

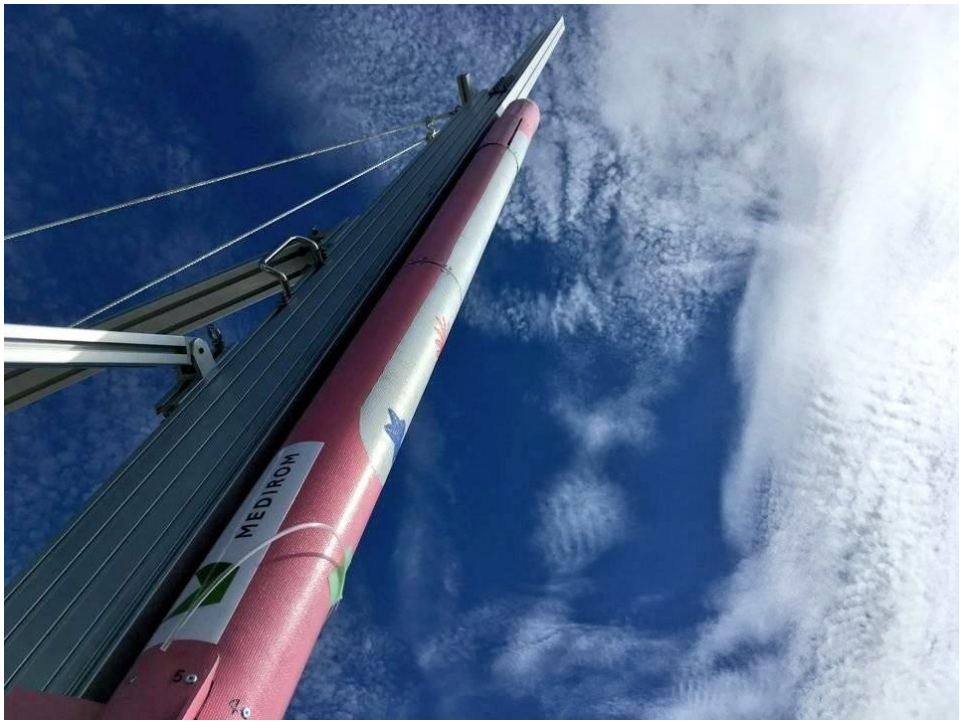
Date	Place	Contents
2016/11/12,13	Ishinomaki rakuyukan	Space and science school
2017/3/4	Tachimati elementary school	Space and science school
2017/3/19	Mt.Mihara, Izu-Oshima Island	PET bottle rocket school
2017/5/3~5	Hirose river miyazawa green space	PET bottle rocket school
2017/5/20	Tachimati elementary school	PET bottle rocket school
2017/8/8	Yuruntei, Kurihara	PET bottle rocket school
2017/8/9,10	Itsustubashi park	Making slime school
2017/8/20	Noshiro space park	Operating robot arm school
2017/9/25	Kesenmuma kaijyo elementary school	Space and science school

Social action works

This year, we challenged new theme schools.
So we could teach the fun of science to many people.
Many people got to know our activities.

PET bottle rocket school

Space and science school



Thanks for your listening

Appendix

Propellants of the motor

Solid + Gas or Liquid

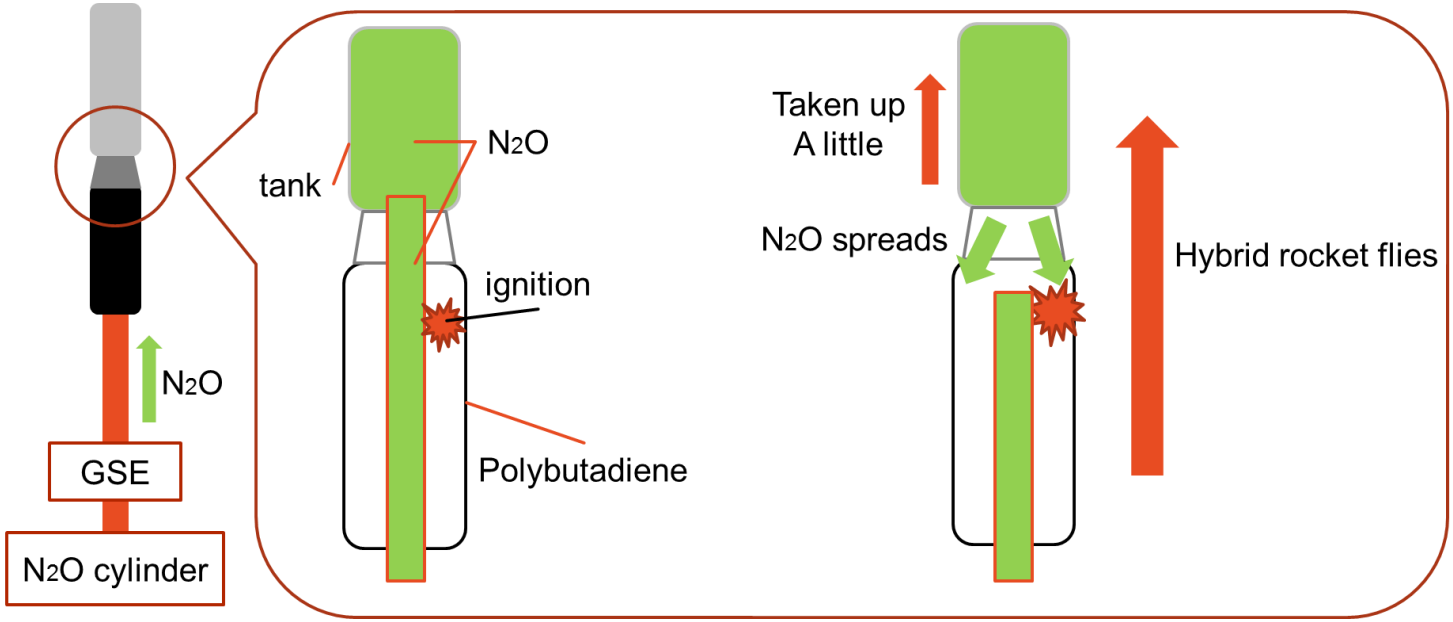
Motors used by amateur rocket groups

HyperTEK series　Cesaroni Technology Inc.

Polybutadiene + N_2O

Appendix

N_2O is carried from its cylinder to the tank through GSE. We call it completing the preparation for launching that the tank is filled with N_2O. When we ignite, the tanks would be taken up a little. Then, N_2O spreads into polybutadiene. After that, it starts firing and the rocket flies.

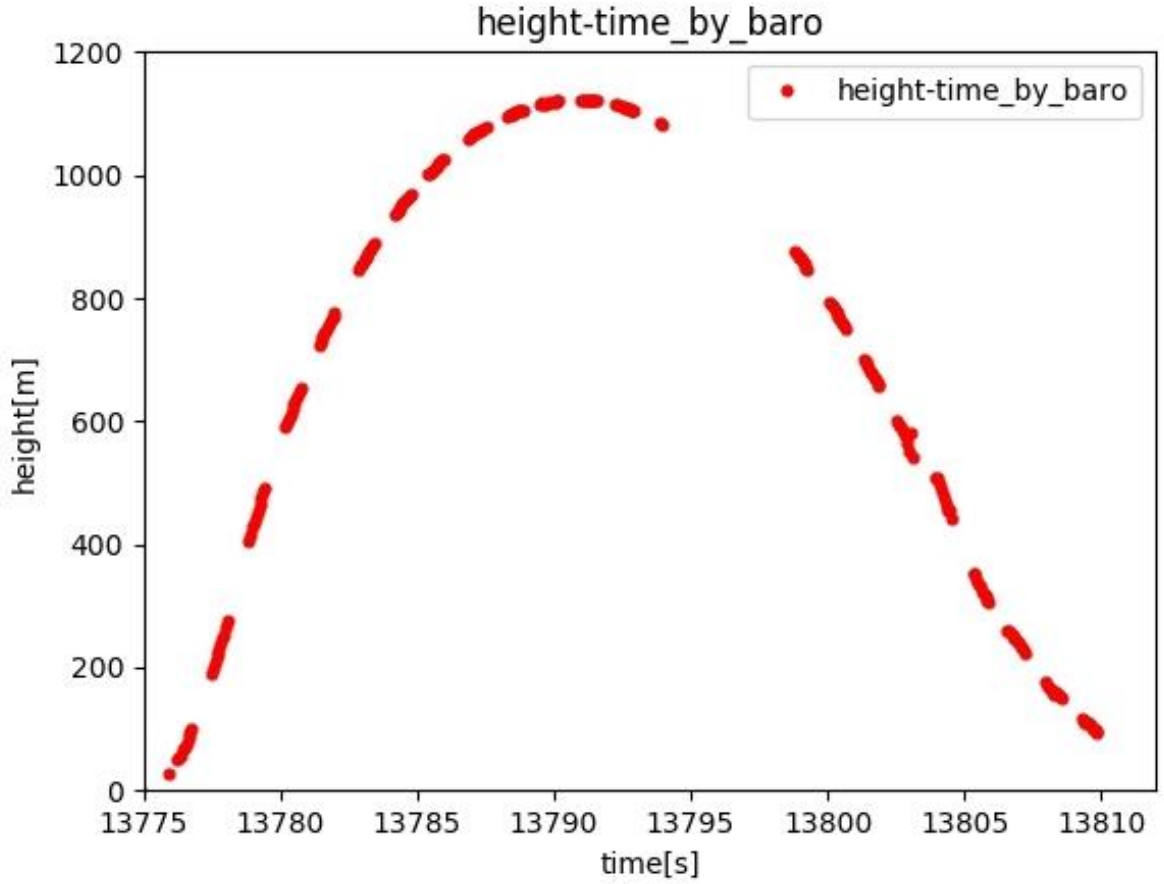


Appendix

- Accelerometer
- Barometer
- GPS
- 3-axis gyro
- Radio module

Appendix

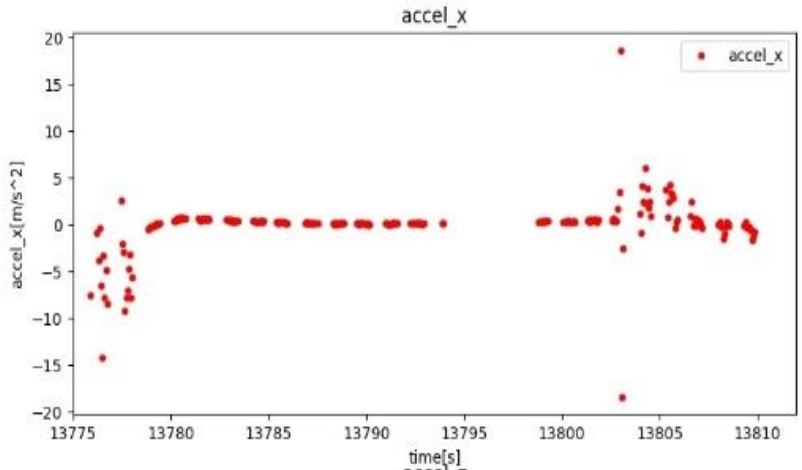
The change of height which was calculate using the data of barometer

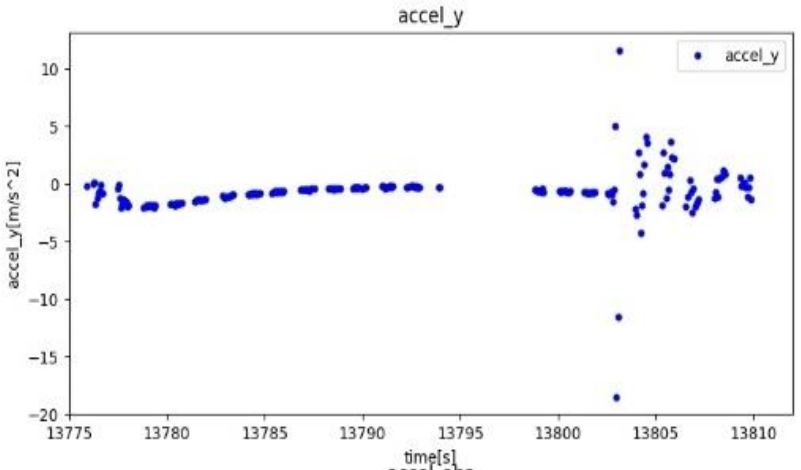


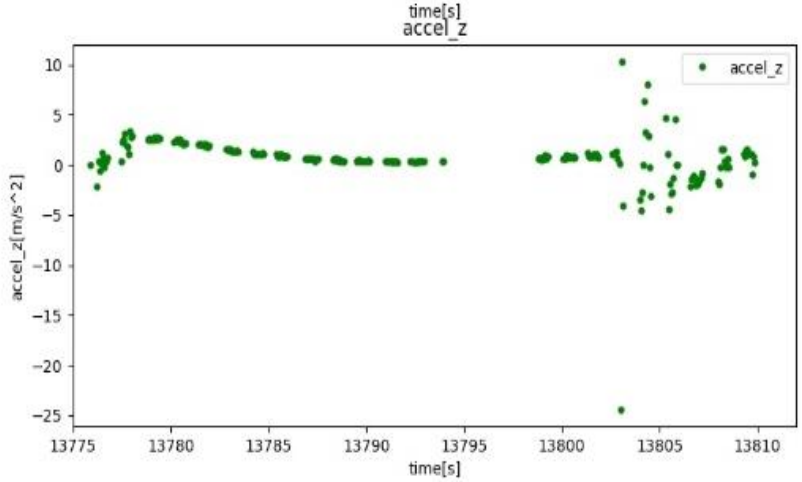
Appendix

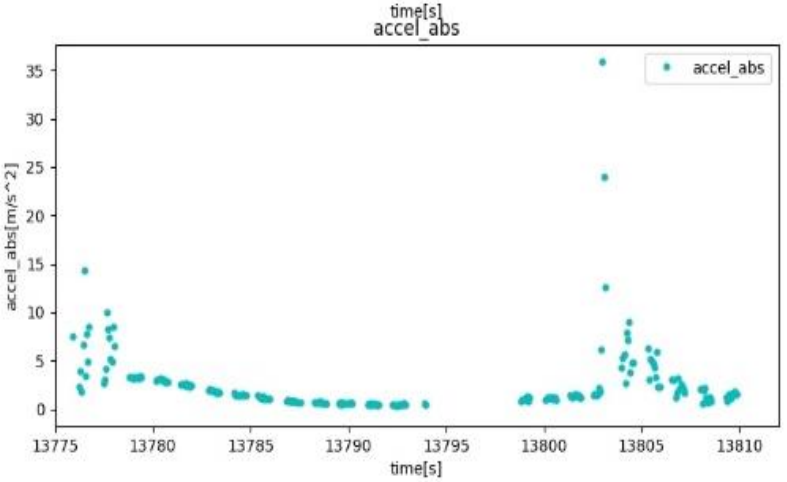
From The Earth since2011

The change of acceleration



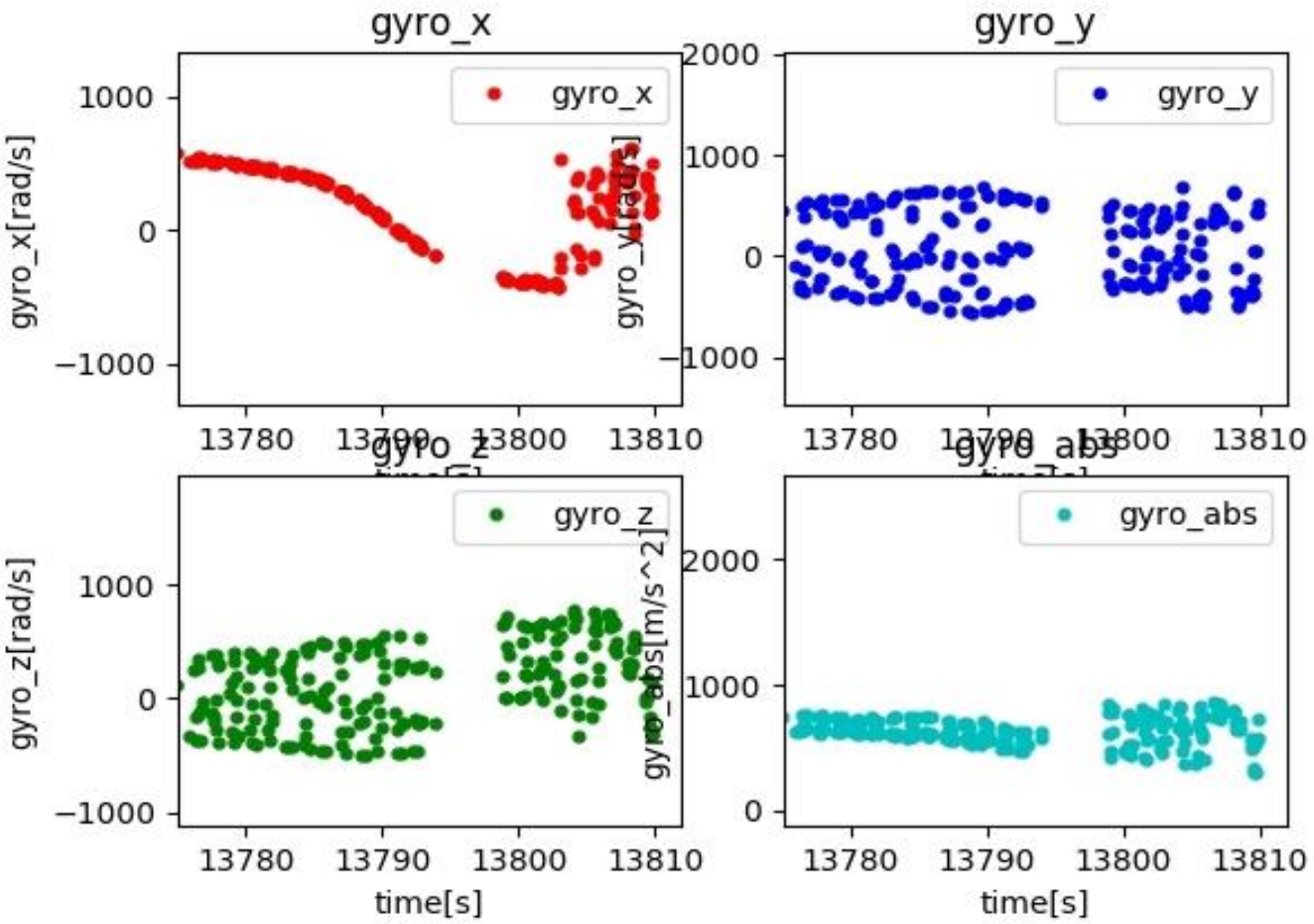






Appendix

The change of angular velocity



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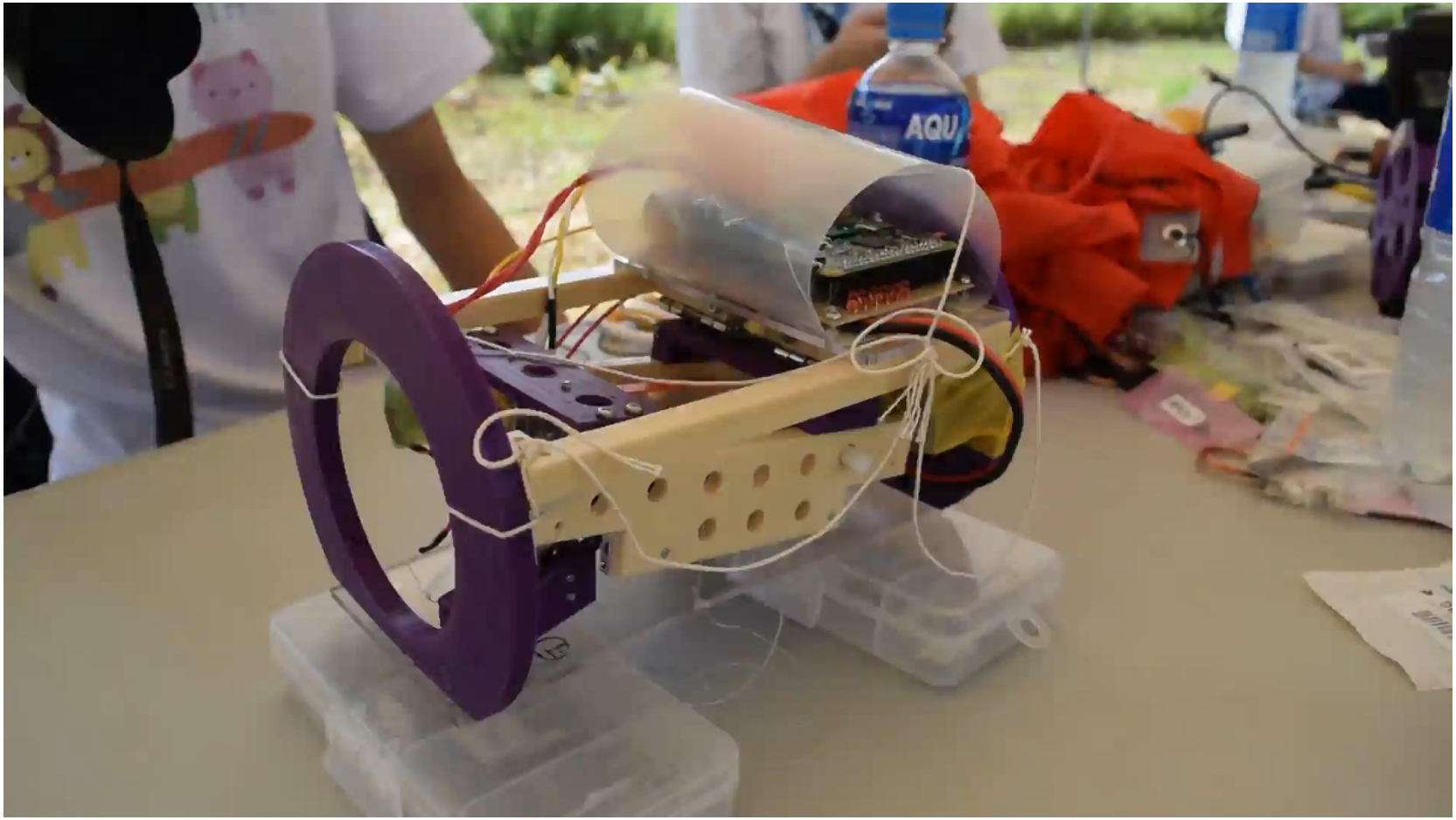

Appendix

Suzume 雀

Suzaku 朱雀