

**27TH**  
**APRSAF**

ASIA-PACIFIC REGIONAL  
SPACE AGENCY FORUM  
ONLINE

# ***Space Education for All Working Group Report***

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# APRSAT-27 Space Education for All Working Group (SE4AWG) Session Objectives and Major activities

- **SE4AWG objectives**

- i) enhance STEAM education with effective usage of space education materials,
- ii) provide all people with space education and training opportunities, and
- iii) promote mutual understanding among countries in the region through exchanging experiences, knowledge, and information.

- **Major collaborative activities**

- Annual session at APRSAT
- Educator seminar
- Water Rocket Event and Poster Contest

# APRSAF-27 Space Education for All Working Group (SE4AWG) Session Day-1

Presentations: 10 presenters from 6 countries and U.N.

- Countries: Vietnam, Thailand, Indonesia, Japan, Australia and Nepal
- Subject: General exchange of views on space education  
Space Education beyond COVID-19 pandemic  
Space Education for primary and secondary school students

Participants: 72 persons (Registered:119)

Discussion: Instruments and Rules of Water Rocket Event,  
especially this year's new trial.

1. It is up to the participants to decide whether or not to use a nozzle for the water rocket.
2. The data acquisition unit will be discussed in a small group for improvement.
3. Take a questionnaire for improvement of the water rocket competition.

# APRSAF-27 Space Education for All Working Group (SE4AWG) Session Day-2

## **I . Presentations**

- 10 presenters from 7 countries
- Countries: Japan, Nepal, Bangladesh, Malaysia, Australia, Philippine and Vietnam
- Contents: Introductions of activities of the Higher Education in the space field in their own countries and global activity by UNISEC
- Participants: 49 persons (Registered:119)

## **II . Discussion of the next Higher Education Session**

- Continue Higher Education Session, next year.
- Exchange information of the best practice and establish mechanisms among universities, industries, space agencies and governments.

## **III . Activity report : Water Rocket Event and Poster Contest**

including the launch of the participating all posters to the ISS

Next year's Poster Contest theme: "Save our Home the Earth"

# APRSAF-27 Space Education for All Working Group (SE4AWG) Session New Challenge

## What's New in this year

- Widening the target range from Primary to Higher education: UNISEC(University Space Engineering Consortium) as a new colleague.
- Adopting Online style of Water Rocket Events with new perspective of its judgement by Data Acquisition Unit

# APRSAF-27 Space Education for All Working Group (SE4AWG) Session New Challenge

## The results of APRSAF27 Online Water Rocket Event

Participants: 64 students and 29 teachers  
from 12 countries and territories

Cambodia, China, Colombia, Japan, Malaysia, Nepal, Pakistan, South Korea, Sri Lanka, Taiwan, Thailand, Vietnam

### Awards:

- *Distance Master*
  - 1<sup>st</sup> Yannick Alejandro Rodríguez(Colombia) Record of Distance: 20cm
  - 2<sup>nd</sup> Sungsu Lee (South Korea) Record of Distance: 23cm
  - 3<sup>rd</sup> Junsik Yang (South Korea) Record of Distance: 24cm
- *Team Award*
  - Team China



# APRSAF-27 Space Education for All Working Group (SE4AWG) Session New Challenge

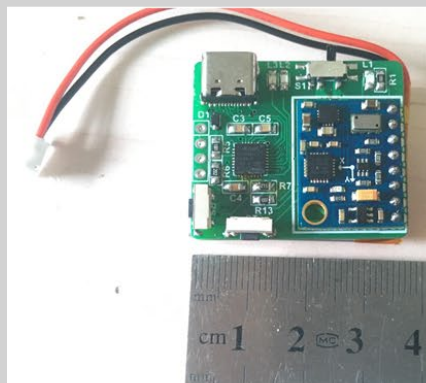
## APRSAF27 WATER ROCKET EVENT

Data Acquisition Unit (Accelerometer)



Instruction of Data Acquisition Unit (Accelerometer)

### Trial report



#### 2. Flight data analysis

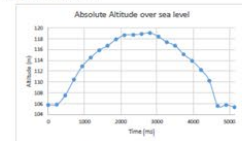


Figure 4. Altitude of the rocket.

Figure 4 shows the absolute altitude of the rocket over sea level. Before the launch, it was approximately 106m and it reached 130m at the highest point. Therefore, relative altitude of the rocket was about 13m.

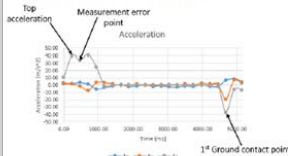


Figure 5. Acceleration in all axis.

Figure 5 shows the acceleration data. Before the launch, z axis showed the acceleration value of around  $10 \text{ m/s}^2$  as the rocket stood still on the launcher. After being launched, its top acceleration was about  $40 \text{ m/s}^2$ . During the descending phase, because the direction of the Az vector is opposite to the

gravity so the acceleration value is nearly zero. As the rocket here was some shocks produced and acceleration in all axis

one point where the sensor missed the acceleration of z axis. To more test to evaluate this error.

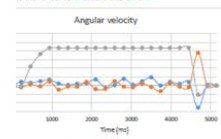


Figure 6. Angular velocity in all axis.

shows the angular velocity in all axis. During the launch, the rate in Z axis, which is normal. Based on this data, stability of be analyzed.

\*Note: From 1000ms to 4000ms, angular velocity in Z axis stayed constant due to the limitation of the measurement range. It could be solved simply by setting to a wider range.

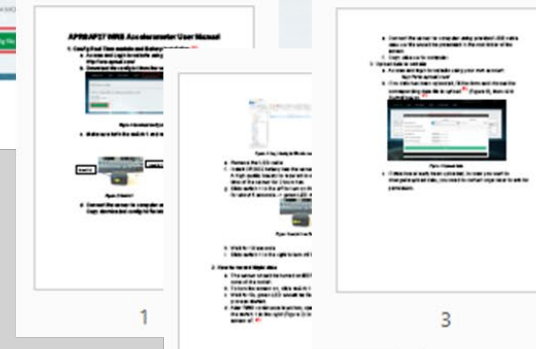
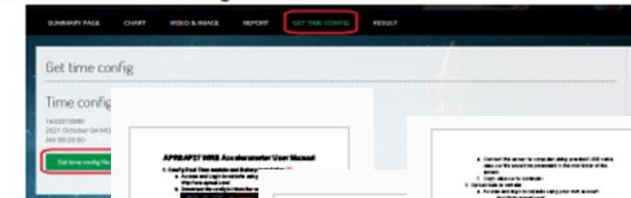
#### Conclusion:

- Accelerometer is functioning properly. It is well responded to the change of the rocket's attitude.
- There are some minor measurement errors that require further evaluation.

### APRSAF27 WRE Accelerometer User Manual

#### 1. Config Real Time module and Battery Installation (\*\*)

- Access and Login to website using your own account: <http://wre-aprsaf.com/>
- Download file config.txt from the website



# APRSAF-27 Space Education for All Working Group (SE4AWG) Session New Challenge

## The results of APRSAF27 Poster Contest

- Theme: “I am an astronaut”
- Style: Online
- Voters: Anyone but only once
- 30 entries from 10 countries:  
Cambodia, China, Indonesia, Japan, Malaysia, Pakistan,  
South Korea, Sri Lanka, Thailand, and Vietnam
- Total number of Votes:1,087  
Registered member - 217votes  
Non-registered member - 870 votes

### *Best Poster Award*



Ms. TEE BEIERR KYRA,  
Malaysia



# APRSAF-27 Space Education for All Working Group (SE4AWG) Session New Challenge

## The results of APRSAF27 Poster Contest

### *Special Poster Award*

### *Special Poster Award*

### *the VNSC Award*



Ms. OOI ZI EN,  
Malaysia

Mr. Milthiades Nathanael,  
Indonesia



Ms. Cheng Nuo Zhang  
Liu, China

### *the JAXA Award*



Ms. Si Chen Xu, China