

Results of Group Discussion

# **Requirements for Attitude Determination and Control System of university satellites**

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# Will be discussed

- Sensors for attitude determination
- Active/passive attitude control
- Configuration of ADCS and its accuracy for different mission types
- Flexibility of ADCS for onboard reprogramming and sensors calibration
- The place for self-developed ADCS for such kind of projects
- The possible role of UNISEC and its network for increasing efficiency of university satellite design

# Expectations from the discussion

- Defining configurations of ADCS for different types of missions
- Ways of decreasing satellites failure rates for future satellites which are either going to be built by new teams or teams with limited experience (using ADCS example)

# Overview of 2 Satellite ADCS

## **BeeagleSat**

### Sensors:

Magnetometer

6 Sun sensors (coarse)

1 Sun sensor (precise)

1 Horizon sensor

1 Gyro

### Active Control:

3 Magnetorquers

1 Reaction Wheel

## **Horyu IV**

### Sensors:

6 Sun sensors (precise)

5 Solar panels

2 Gyros

GPS

### Passive Control:

1 Permanent magnet

1 Hysteresis Damper

# Minimum Required ADCS components

## Remote Sensing **$\pm 1$ deg**

### Sensors:

1 Gyro 3-axis

1 Sun sensor (precise) FOV  
180 deg

1 Magnetometer 3-axis

Horizon sensor

### Active Control:

3 Magnetorquers

3 Reaction Wheel

## Scientific Mission **$\pm 10$ deg**

### Sensors:

6 Sun sensors (coarse)

1 Magnetometer

### Passive Control:

1 Permanent magnet

1 Hysteresis Damper

# Group Recommendation

## ONLINE PLATFORM

- Basic info for each Spacecraft Subsystem
- History Log of executed missions
- FORUM / FAQ
- Analysis data and Conclusions
- Online Library
- Lessons

# Building the Platform

- UNISEC members can contribute
- Motivation for volunteers
  - Recognition by UNISEC Community
  - Networking
  - Other benefits

Japan

Turkey

Bulgaria

Egypt

Mexico

Nigeria

Ukraine

