



LignoStella
project

Greening space systems engineering

Kenji MIKI (PhD)
Motoki SOTSUKA

Outline of LignoSat project

Green Growth Strategy through achieving carbon neutrality in 2050
“Establishing a cyclical use of “harvesting, using, and planting” for planted forests.
Promoting the reforestation and use of wood”

**Application to
space exploration**

**Project Rep.
Kyoto University**

- ☑ Wooden satellite development
- ☑ Exposure of timber to space
- ☑ Growing tree in low pressure
- ☑ Education opportunities

**Research
collaboration**

Sumitomo Forestry

Social implementation
 Realisation of forest industry market
 extension to space exploration

Achievement of carbon neutrality in space exploration

Lignosat Project for analysis of usability of wood in space

LignoSat team

1 project leader + 5 researchers + 2 technical staff

Supervise

Student team

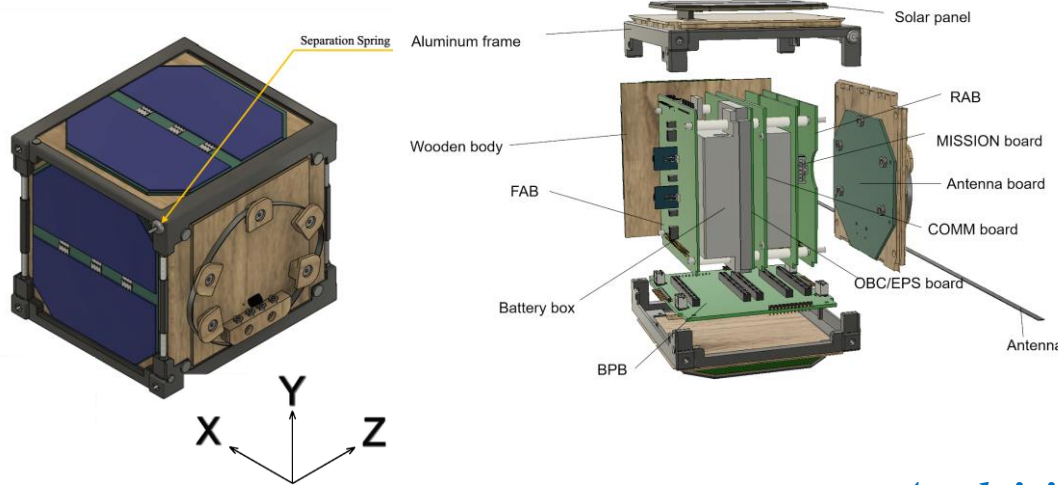
Structure, Command and Data Handling,
Electrical Power Subsystem, Communication, Mission



LignoSat's Missions

LignoSat

1U-sized CubeSat whose outside structure is mainly composed of wood



Specifications

- Size:
100 mm x 100 mm x 113.5 mm
- Mass:
Within 1.33 kg
- Planed to release from ISS in 2023
(Aluminum frames are installed as an appropriate interface)

Missions

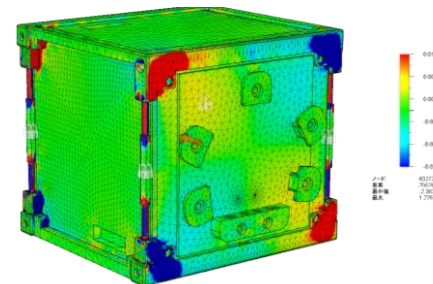
1. Continuously measure internal **temperature**, **geomagnetism**, and **strain** of wooden structure
2. Contribute to the success of the **interactive** amateur radio satellite **communication** using UHF bands



Demonstrate the technology of using wood in space environment

Analysis and evaluation tests

✓ FEM analysis



✓ Vibration test



Summary

- LignoSat project aims for carbon neutrality by new market entry of wood industry in space exploration
- LignoSat project offers educational opportunities to students with various backgrounds
- Currently preparing for safety review and designing satellite mission