La SEINE

Cal Poly
Internship achievement report

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University

***Cal Poly* (*California Polytechnic State University*)**

Location : San Luis Obispo, California

Founding : 1901

Colleges :

- Agriculture, Food & Environmental Science
- Architecture & Environmental Design
- Engineering
- Liberal Arts
- Science & Mathematics
- Business

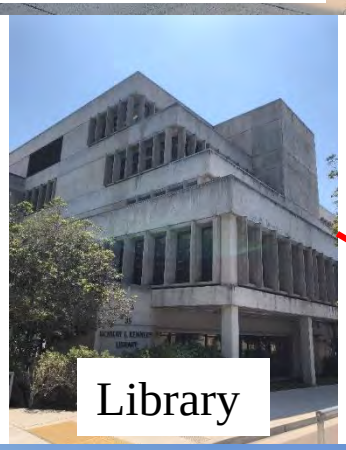
Features :

- Excellent in the field of Agriculture, Architecture, Engineering
- Vast campus

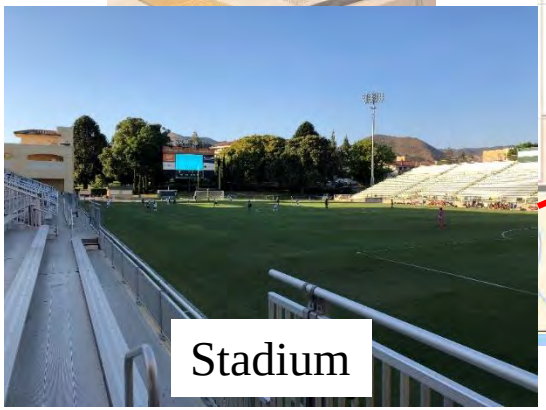
University

Campus

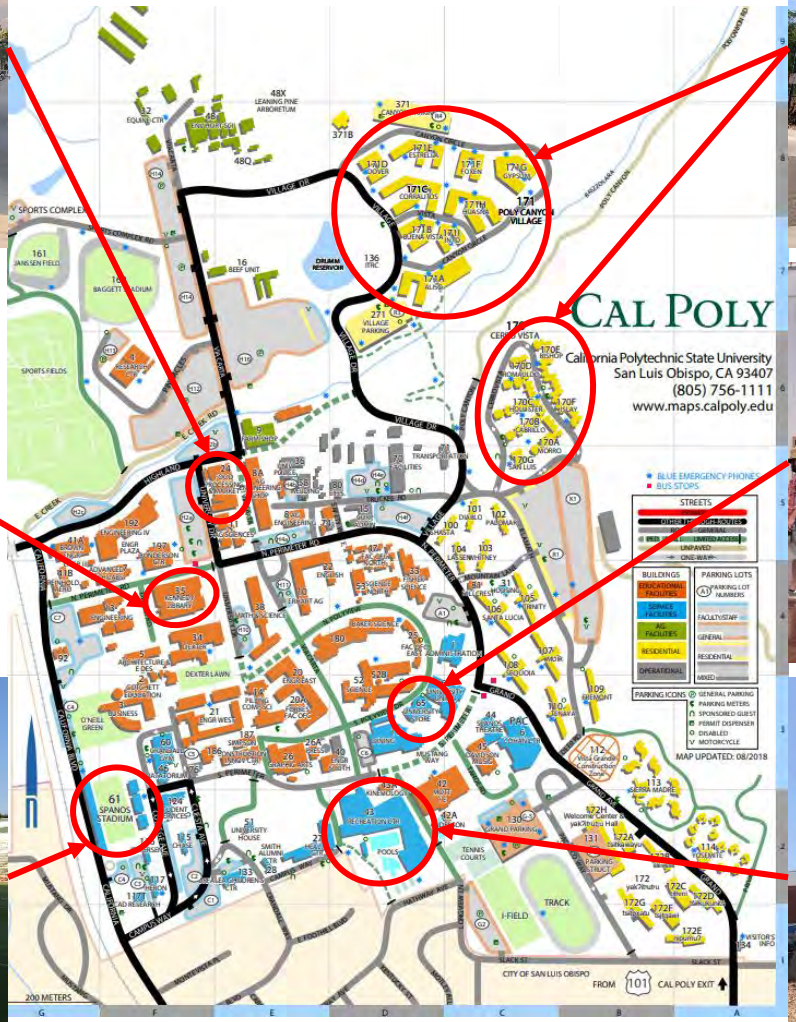
Market & Cafe



Library



Stadium



Apartment

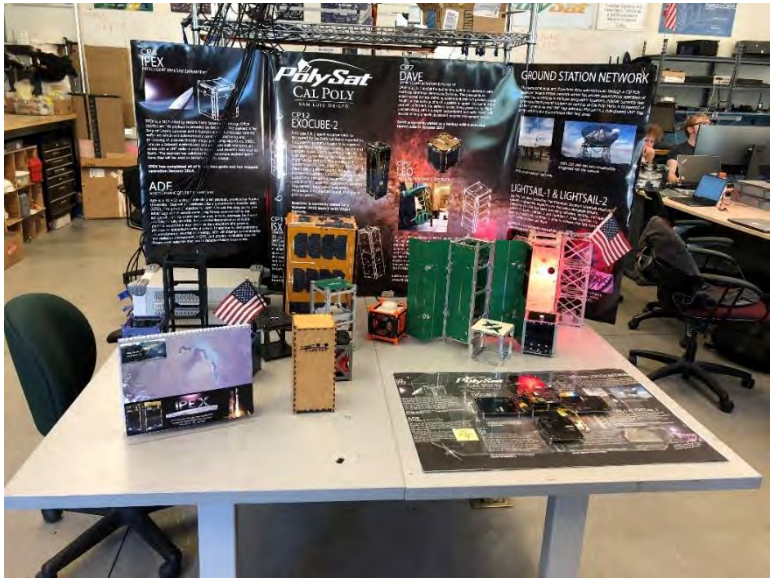
Bowling alley

Sports gym

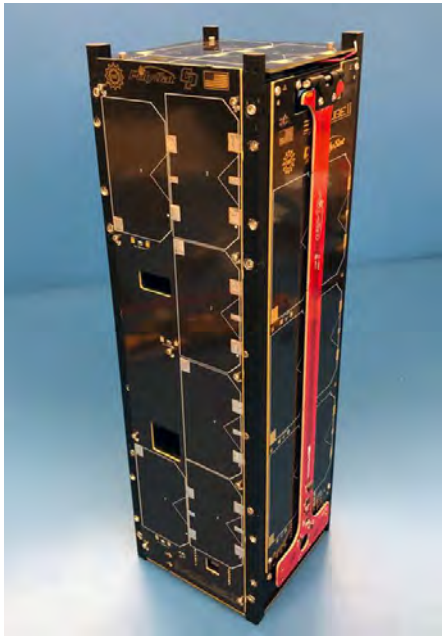
University

Laboratory

- Equipment is almost the same
- Pioneer of Cube Sat
- They are currently developing ExoCube 2



Laboratory



ExoCube 2

experimental aircraft

Antenna

Differences

- Epoxy resin coating on electronic substrate
- Confirmation of bubble by black light
- How to attach solar cell
- Use of conductive adhesive

Living environment

Apartment

Basketball Court

Pool

Beach volleyball court

Living environment

Room

Bet room

Living

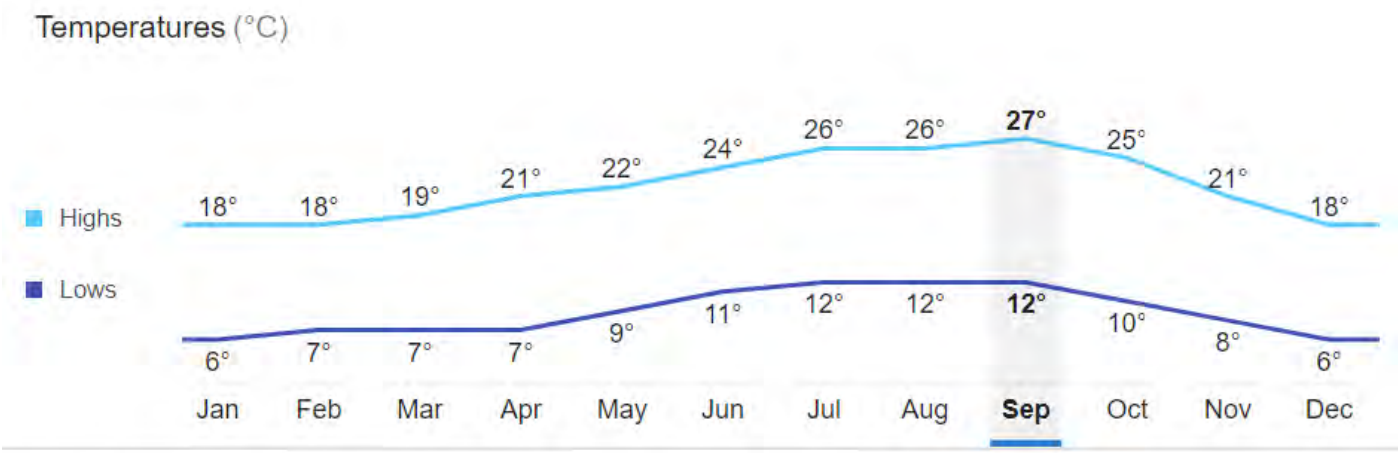
Kitchen

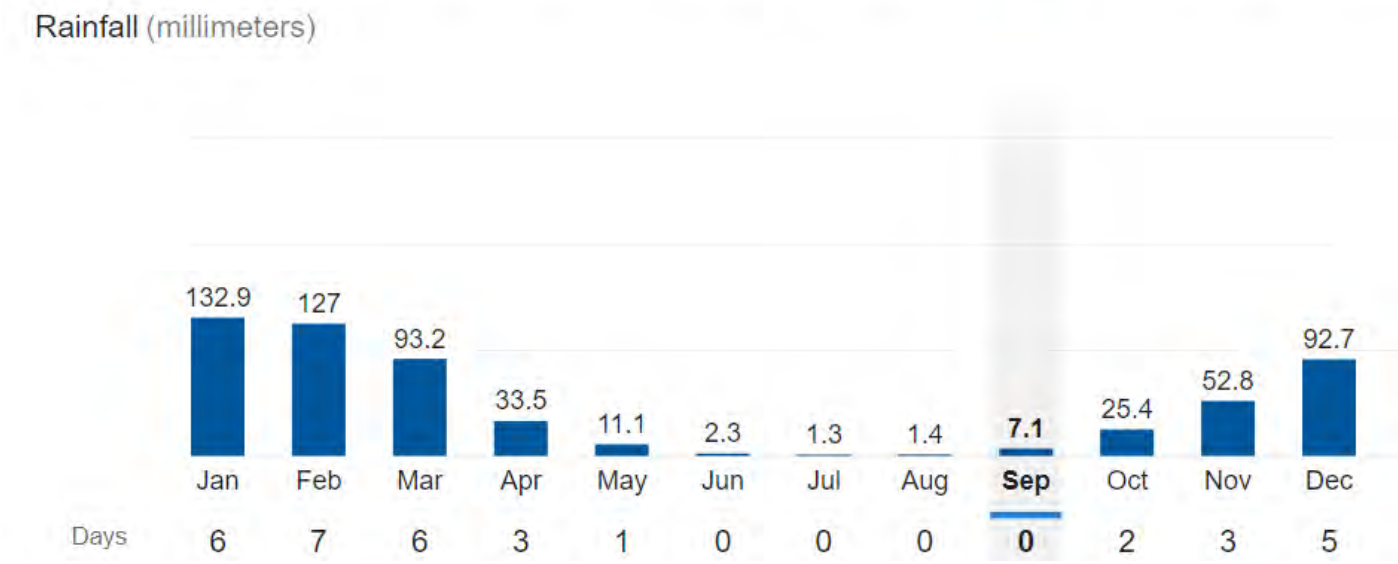
Living environment

Climate

Mediterranean climate

- It does not rain in the summer
- It is cool in the summer and warm in the winter





Living environment

Climate

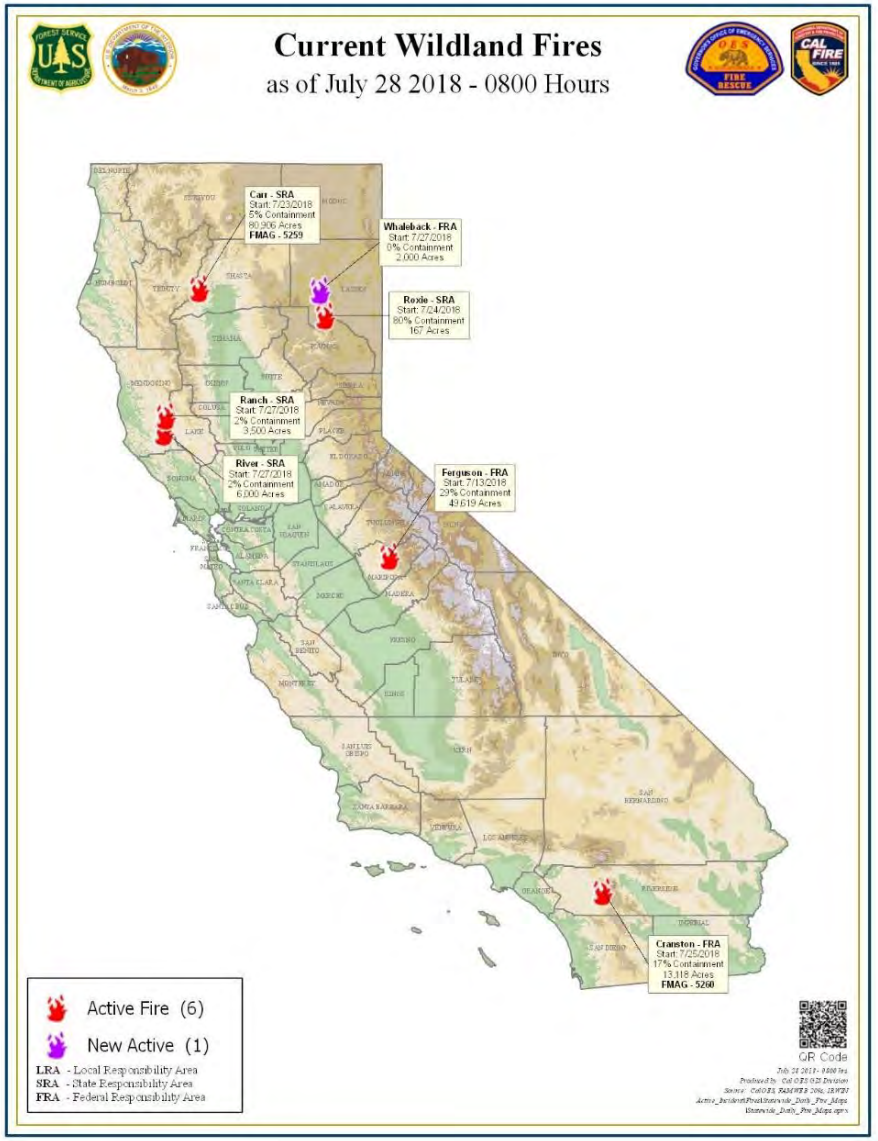
Mediterranean climate

- The sun is strong and dries
- Dry-resistant grapes and oranges and other fruits · Citrus cultivation

Living environment

Climate

- Wildfires frequently occur
- Wildfire damage was great this summer as well



Living environment

Meal

Taco (Mexico)

Pizza (Italy)

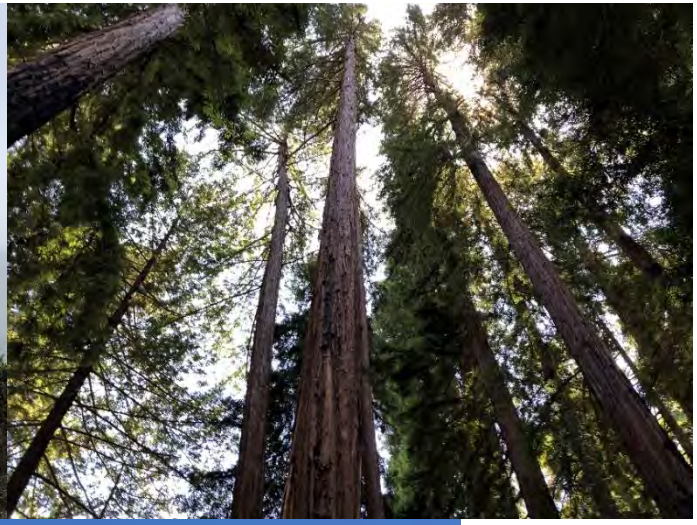
Hamburger (America)

Poke Bowl (Hawaii)

Tourism

Big Sur





Tourism

Downtown

Tourism

Downtown

History Center

Mission

Library

Theater

Tourism

Farmers Market

Stall stand

Concert

Tourism

Animal

Elephant Seals

Steller's Jay

Squirrel

Turkey

Deer

Research

Research topic

Design a storage and deployment method for a long deployable Langmuir probe

Research

Background

- Research of plasma continues all over the world
- Miniaturization of test sensor
- Increase the opportunity of observation by installing sensors on CubeSat and microsatellite

Research

Outline

- Perform research into replicating sensors on key spacecraft missions from previous decades, and shrinking the sensors to micro-satellite and CubeSat size
- Develop and test sensors for use on future Cubesat and micro-satellite missions.
- Theoretically reproduce key spacecraft missions using a series of Cubesat deployed from a single mothership.

Purpose

- Design a storage and deployment method for a long deployable Langmuir probe.

Research

Design requirement

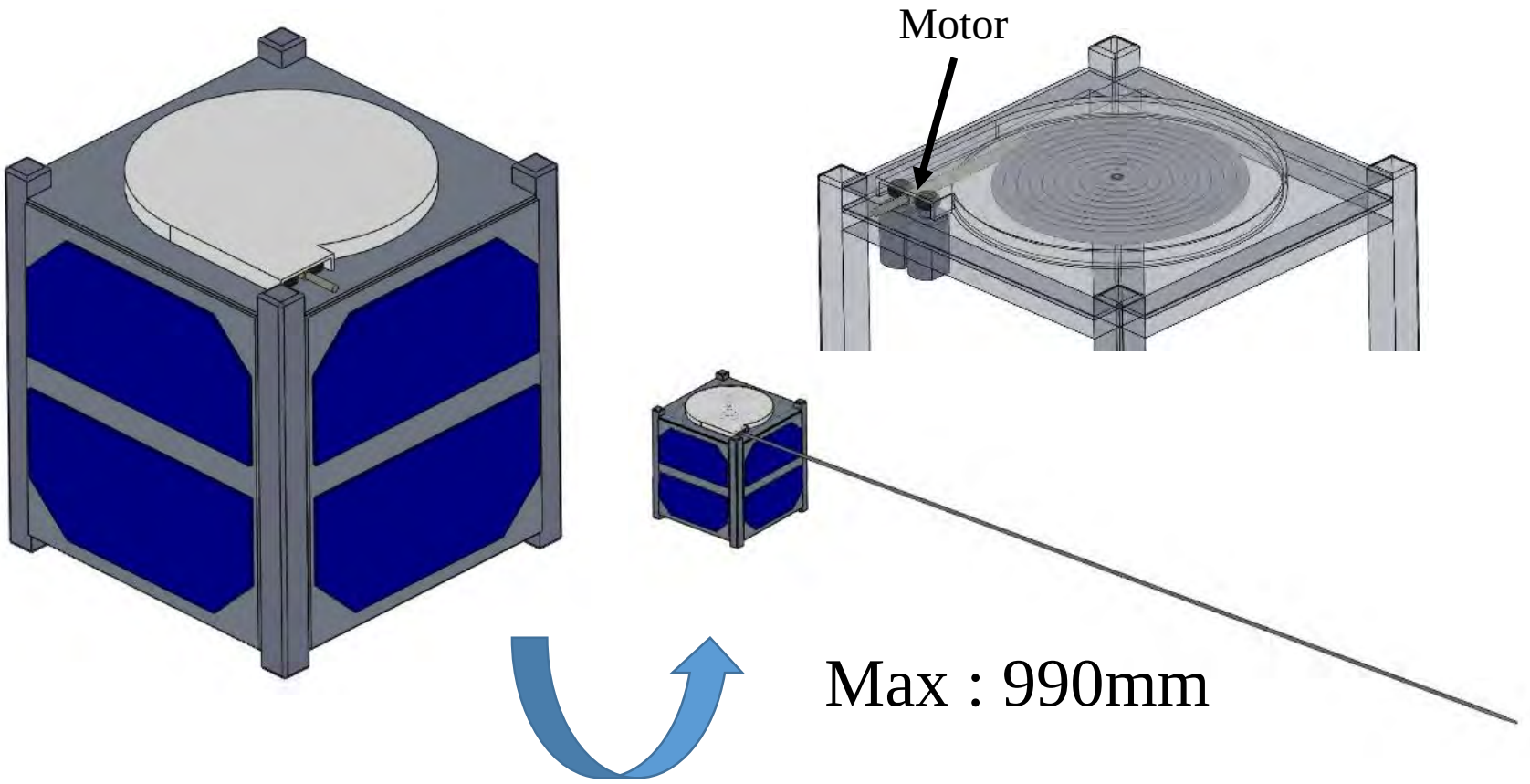
- Available space is 1/4 U
- By having an extended Langmuir probe at a large difference from the spacecraft, make these measurements outside the wake region of the satellite
- make simultaneous multi-point measurements with the same spacecraft (put 1 probe on the spacecraft and deploy 1 a large distance away)

Research

Method

1. Enumeration of expansion methods
2. Select deployable structure applicable to probe
3. Modeled by 3DCAD
4. Measurement of the length of Langmuir probe that can be developed
5. Determination of deployment method

Conclusion



- Mounted on + Z plane
- Deployment using motor

Research

Future Tasks

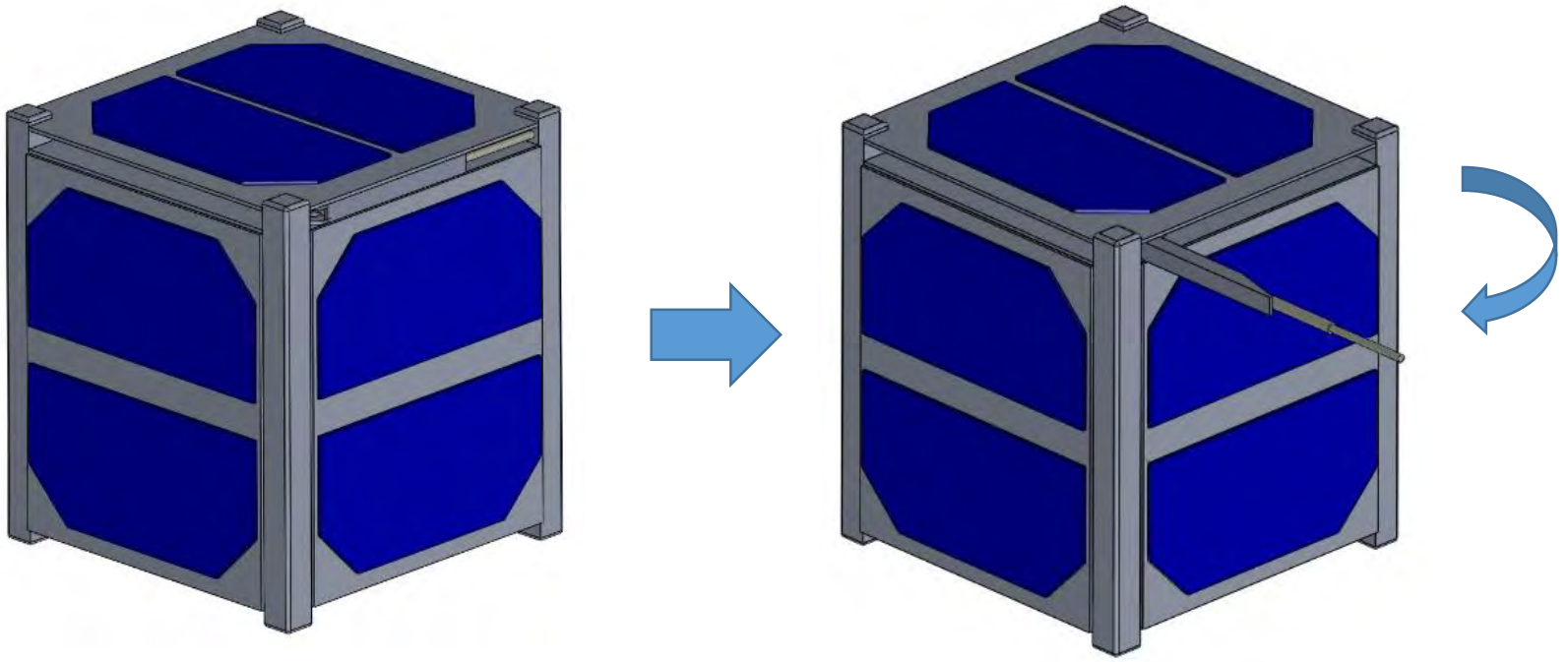
- Selection of used parts
- Production of prototype

Thank you

Result

Option 1

Max : 80mm

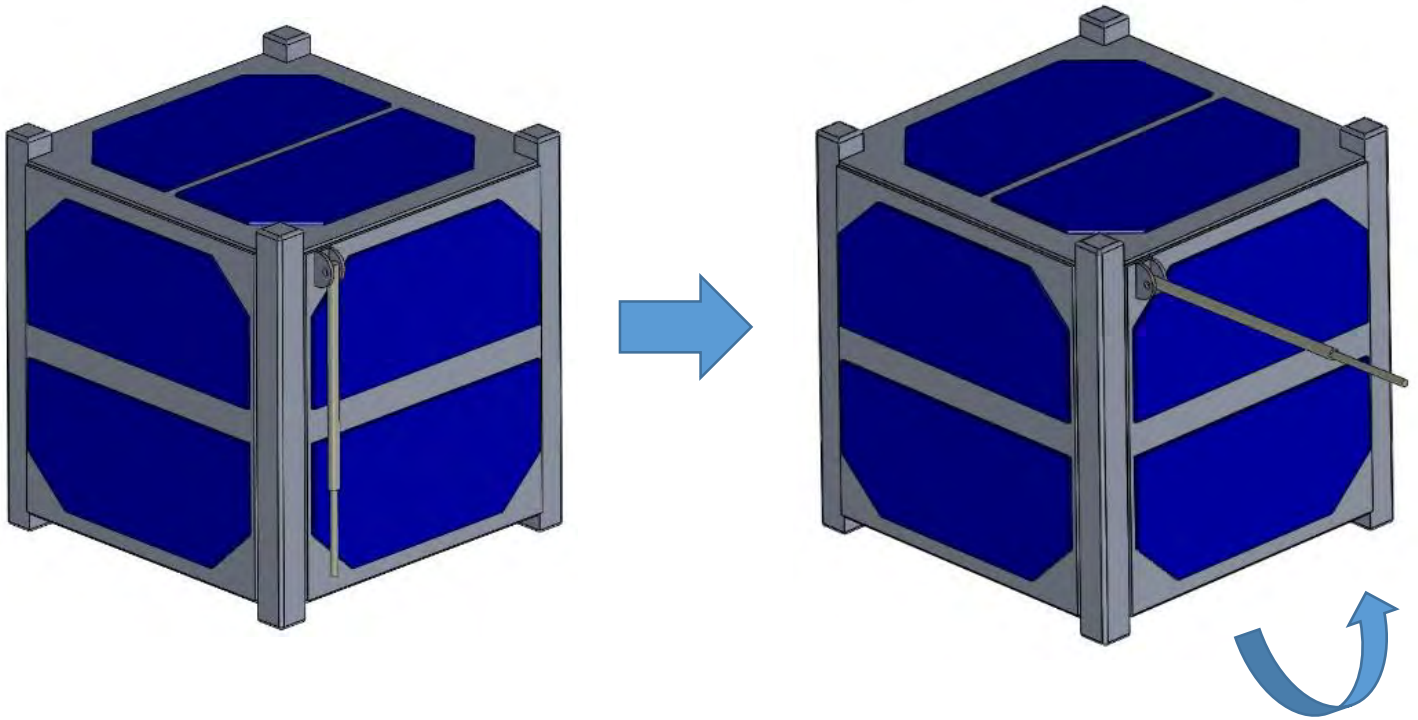


- Mounted on + Z plane
- Expansion by spring mechanism and tegus

Result

Option 2

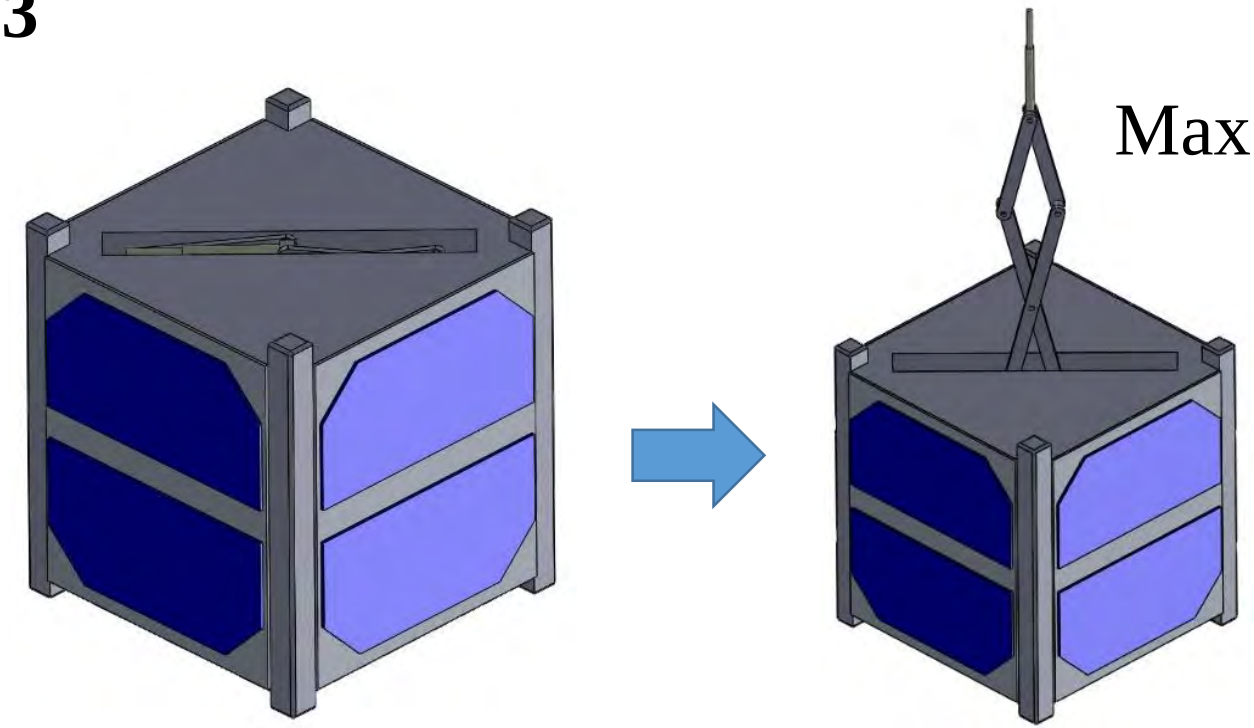
Max : 90mm



- Mounted on ±X or ±Y plane
- Expansion by spring mechanism and tegus

Result

Option 3



Max : 160mm

- Mounted on + Z plane
- Developed by a mechanism like a magic hand