# Mechanical Requirements and Interfaces

# Mechanical Requirements

## Structural

- Dimensional Requirements
  - Shall comply with 1U CubeSat reqs
  - Shall have a CoG within 2 cm of origin
  - Shall comply with EXOPod interface reqs
  - Origin shall be at geometric centre
- Testing Requirements
  - Shall pass random vibe test (<400Hz) and shock test
- Material Requirements
  - CubeSAT structure shall be made of aluminium alloy (50xx/60xx/70xx)
- Mechanical Function Requirements
  - Should house PCB's, sensors, and other equipment
  - Will have deployable antenna and solar panels (panel dimensions TBD)

## Thermal

- Thermal survivability requirements
  - Shall survive in a high-vacuum environment with high temperatures in accordance with the CubeSat-to-dispenser ICD requirements.
  - Shall maintain operating temperatures for all on board components including but not restricted to PCBs, solar panels, transmitters, cameras, GPU, actuators, sensors, and batteries.
- Testing Requirements
  - Shall pass the Thermal Vacuum Bakeout Testing.
  - Should pass the TVAC cycling testing.

## GNC

- Sensor, actuator specs and quantity.
- Sensor, actuator mounting regions.
- Thermal output of sensors, actuators

## Comms

- Deployment and positioning of antenna
- Avoiding noise and interference from other hardware
- Location of communication equipment
- Transceiver thermal consideration
- Deployment timings after detachment
- Mass considerations

## Vision

- 6 cameras, 1 on each face
- Vibration reduction for image stability
- Thermal protection for camera equipment
- Radiation protection for camera equipment

## Embedded

- Solar Panel Sizing and Count
- Battery Spaceclaim
- RBF and Deployment Switch
- PCB Mounting and Spaceclaim
- Wire Harnessing
- Sensor Space claims
- Mass and CoG Budgets
- Thermal Budgets