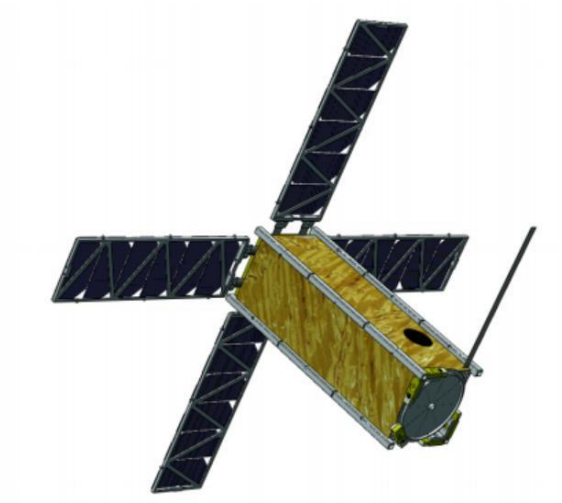
DESIGN OF MEDITERRANÉE 3U CUBESAT ELECTRICAL POWER SYSTEM

1. Background

The mission objective of ROBUSTA-3A Mediterrannée is to demonstrate the ability of a 3U CubeSat based system to collect meteorological data onboard ships located in the western Mediterranean Sea (between France, Spain, Italy and North Africa) and rapidly transfer this data to Météo France for storm forecasting.
The Cubesat is developed by Student as the Centre Spatial Universitaire the Montpellier. One important part of the satellite development is the design of an efficient power management system based on Solar Generator, secondary batteries and 30 W DC/DC convertor.

2. Internship Objectives



- In interaction with a team of students, engineers and scientists, the intern will need an important understanding of system level engineering.
- This internship focusing on power management design will allow the student to tackle many aspects of spacecraft design.
- Perform a small bibliographic research on the specific aspect of satellite power generation and power management system design.
- Establish the power budget of the satellite using IDM-CIC tools.
- Create high level models of the system and its sub-systems, in agreement with the satellite requirements, that will allow the implementation of the solar generator, the batteries and the power management board models in a simulation environment.
- Guarantee the power sufficiency by verifying the offline execution of all tasks without power deficiency until the end of the satellite's lifetime.
- Specify and justify the choice of the devices and the design of a 30W DC/DC convertor.
- Specify and justify the choice and the configuration of the used batteries.
- Specify and justify the choice of the microcontroller chosen for the design and the implementation of the power management system.
- Perform modeling and simulation (temporal and transient simulation) in accordance with the MAR and the satellite current design.

3. Internship Condition

- The internship will be of 5 to 6 months (September to February)
- The internship will take place in Montpellier
- A report shall be written to document the work