Inter-American University of Puerto Rico

HASP 2014

February Monthly Status Report

During the month of February the Thermal Energy Control & Particle Air Filter System (TECPAFS) team addressed the comments on the Payload Summary Sheet report, as a priority. The milestone list is in progress (90%), more subsystem steps needed for completion. The thermal structure of the project has been completed, the full schematic is in progress and it shall be completed for next week. Currently we are working on gathering the necessary information and preparations for the Preliminary Payload Specification and Integration Plan.

Team Activities

1. The Power team (PT) is currently waiting for the components to arrive so they can make the assembly and power tests and generate test data. Working in collaboration with TT and ST to analyze the necessary film resistance heaters and the vacuum pump.
2. The Software team (CT) have been working with Arduino libraries and interpreting the data. They managed to read and write to the SD card simple information in text form (.txt). Started managing mathematics function to calibrate and reading the barometer information and saving it to the micro SD card in (.CSV) format to separate the data and open it in Excel to read it more easily. Practicing how to implement SPI Interface. Currently working with a prototype program for the Analog to Digital Converter (ADC).
3. The Structure team (ST) is working on preliminary SolidWorks designs of the components inside the structure and studying a specific orientation needed for the incorporation of the particle air filter system with the PCM's. Analyzing the air particle filter system with the required vacuum pump to work from 0 km to 10 km of altitude. The outside of the structure has been finished with the specific dimensions.
4. The Thermal team (TT) is currently working on the selection and purchase of the film resistance heaters needed to be used as the heat source for the PCM experiment. The TT worked in collaboration with the ST to determine the final structure design for the PCM experiment and measurements. Finally, the TT is starting to work with the ST on a simulation of the thermal structure being exposed to the changing temperatures of the experiment, the atmospheric temperature at ~36 km of altitude and the films resistance heaters. ~ (-30 to 60)°C

Issues Encountered during Payload Design / Development

1. Vacuum pump for particle air collection to the filter system.

2. Power consumption from the heating films being researched.
3. Some components software code interpretation, but minimum.

Milestone

The TECPAFS team is currently working on the Test & Integration Planning part of the milestones. At the same time, still undergoing some research for specifications needed from the Subsystem Design Planning phase, which is 80% complete.

Current Team Members

This month's report demonstrates team changes on the TECPAFS project. Recruiting of new students was necessary given the work needed for the success of the project. Here is a structure of the project, advisors, and student leader and team members:

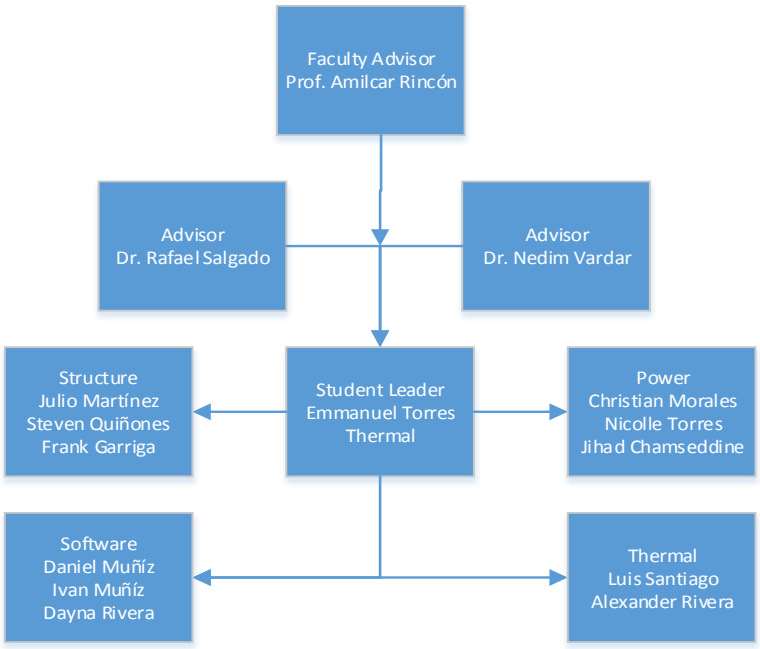

Figure 1 - TECPAFS team structure