

IUPR Progress Report  
April 30, 2011

Team Activities

EQUIS ADS 2010 Payload

The team started to order the components that need to build the calibration set up. A procedure for automated calibration of the IMU system was written.

No change to the payload as to not interfere with the EQUIS flight readiness status.

TigreSat 2011 payload

The layout of the ADS PCB was completed and sent for production. The PCB has been delivered to the team.

A list of surface mount components has been generated. The next step is to populate the board and verify its performance.

The structural team has built the 1U cubesat structure. It will undergo structural and thermal test.

The five solar panels were completed. They have been tested under thermal and vacuum conditions.

To test the performance of the solar panel in flight conditions, a programmable load has been designed and simulated. The objective of this additional circuit is to be able to acquire the solar panel characterization curve during the HASP 2011 Flight. This curve will show exactly the solar panels will behave at different temperatures and solar radiation in space. To be able to accomplish this one needs to be capable of varying a load that will only be seen by the solar panel. One method, and probably the most common, is by using a MOSFET. The most important characteristic that matter from the MOSFET is that the resistance seen from the Drain and Source depends on the voltage applied in the Gate, only for a certain range. If the voltage, we can control the load seen by the solar panels as well. We will vary this voltage using a micro-controller PWM signal. This micro-controller will also have a feedback loop from the solar panels current which will help us ensure that the current been drawn by the solar panel is the one we chose. The necessary data, voltage, current and temperature from the solar panels, will be stored in an SD card which will be read when the mission ends. Some sample parts have been ordered for testing.

The command and data handling software using the Adrunio micro-controller is 80 % completed.

Materials to build the rotating table have been ordered and delivered.

Ordering a motor to work at near space condition has not been an easy task. A motor along with proper encoder has been identified from Maxon and will be ordered soon.



### ARIES Student and Tasks

Student	Task
Javier Espinosa	EE
Abdiani Rivera	ME
Ana Espinal	EE
Luis J Diaz	EE
Mairim Nevarez	EE
Orlando Buzo	EE
Alexander Santiago	ME
Abel Torres	CE
Jose Fermin	ME
Victoria Gonzalez	ME
Jose Almonte	CE
Abel Torres	CE
Jose Molina	CE

EE- Electrical Engineering

CE- Computer Engineering

ME- Mechanical Engineering

Student Leader:

Javier Espinosa

Faculty Advisor:

Dr. H. Vo