



# HASP 2018 Monthly Status Report

**Report Month:** January, 2018  
**Submitted by:** Vincent van den Moortel/Erik de Schrijver  
**Submit Date:** 01 / 31 / 2018  
**Institution:** Sint-Pieterscollege Jette/Belgium  
**Payload Number:** 2018-08  
**Payload Name:** STRAINS - Stratospheric Radiation Instruments

## I) Activities During Previous Month:

- 3D Geiger counter support structure redesigned.
- Design of the Geiger Counter PCB.
- Gamma spectrometer support structure redesigned.
- Gamma spectrometer connectors ordered and received: all parts now in hand.
- Aluminum casing parts ordered and received. Preliminary integration nominal.

## II) Issues Encountered:

- The 3D Geiger counter support structure had to be redesigned to increase the margin by which it would fit inside the 'small payloads' volume. At 13,5cm width, that margin was considered too narrow. After redesign, setup width is now a nice 12,0cm.
- The original Gamma spectrometer design called for the NaI crystal to be on top, and the signal processing electronics at the bottom of the setup. Since the crystal is by far the heaviest part of the instrument, that caused stability concerns in the case of a hard landing, and brought forth problems concerning the means by which to secure the instrument to the casing. It was therefore decided to reverse the whole setup, keeping the crystal low. The 3D printed support structure (that secures the joint between the crystal and the PMT, and also holds the mu metal shield) was redesigned to carry a base plate for securing the instrument to the casing's base plate using screws. Additionally, this setup allows access to the instrument in case a problem is identified in testing: unscrewing will do. In the first design, the support structure was glued shut and could therefore not be reopened once sealed.
- The aluminum beams ordered initially had no treaded hole in the center. That called for the corners to be joined using L-joints with protruding screws, which threatened to compromise the integrity of the thermal protection panels under design. It would also have reduced the part of the beam that was clear for securing boards or other parts of the setup, and might even cause minor injury when handled without proper care. New beams (with treaded center and assorted corner 'cubes') were ordered from a different supplier, solving all these issues at once.

### III) Milestones Achieved:

- 3D Geiger counter support structure redesigned. Mechanical integration tested. Mechanical design validated.
- 3D Geiger counter PCB designed.
- Gamma spectrometer support structure redesigned. Mechanical integration tested. Mechanical design validated.
- Proper aluminum beams acquired, integration tests satisfactory.

### IV) Plans for Coming Month:

- 3D Geiger counter PCB to be etched, drilled, soldered and tested. Software integrated.
- 3D Geiger counter full systems test.
- Gamma spectrometer in 'counter' mode tested on PC. HV risk mitigation measures identified.
- Aluminum casing beams to be cut to size. Mechanical integration of the casing. Casing's integration validated.
- Additional sensors PCB design and manufacture. Software integration.

### V) Other Comments:

Outreach and fundraising activities to start within the coming days and weeks.

### VI) Team Composition and Organization:

All student work assignments are based on volunteering. Students join forces on specific tasks as they see fit. The team leader's job is to supervise progress, deal with problems, and mind the timeline.

Students working on software and pcb design now have curriculum time to work on their respective projects. It is to be expected this will speed up design and development processes.

When hard- and software on any subsystem are ready for testing, all students involved perform the tests together so any issues can be readily identified and tackled. This 'multidisciplinary' approach also fosters greater understanding in the students of all aspects of the project.

Name	Start Date	End Date	Role	Student Status	Race	Ethnicity	Gender	Disabled
Vincent Van den Moortel	10/01/17	-	Team leader	12 <sup>th</sup> grade (senior high)			M	No
Jennifer Pham Van	10/01/17	-	Mechanical	12 <sup>th</sup> grade (senior high)			F	No
Ellen Van den Bossche*	10/01/17	-	Integration	12 <sup>th</sup> grade (senior high)			F	No
Elie Kochuyt	10/01/17	-	Electronical	12 <sup>th</sup> grade (senior high)			M	No
Jerome Sleewaegen	10/01/17	-	Mechanical	11 <sup>th</sup> grade (junior high)			M	No
Emilie Sanvito	10/01/17	-	Electronical	11 <sup>th</sup> grade (junior high)			F	No
Elise Van den Bossche*	10/01/17	-	Electronical	11 <sup>th</sup> grade (junior high)			F	No
Ebe Coomans	10/01/17	-	Software	11 <sup>th</sup> grade (junior high)			M	No
Jeff Van den Bossche*	10/01/17	-	Software	11 <sup>th</sup> grade (junior high)			M	No

(\*Despite a common family name, these students are unrelated)

('Race' and 'ethnicity' are unfamiliar – and some would argue offensive - concepts in Belgian education)