IGOSat Project

Internship proposal – Fall 2017

Scintillator test bench for IGOSat

Skills, key-words : Analog electronics, Microcontroller programming, instrumentation,

Study level: 4th Year/ Master Degree

Duration : 6 months

Stipend : 554 € / months

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Internship description :

      The Laboratories of Excellence (LabEx) UnivEarthS [1], set up by AIM (Astrophysics, Instrumentation and Modelling [2]), APC (AstroParticle and Cosmology [3]) and IPGP (Institut de Physique du Globe de Paris [4]) of Paris Diderot University [4], allowed the emergence of cross-cutting projects in these three laboratories.

Taking advantage of the strong involvement of these laboratories in numerous experiments and space instruments, a nanosatellite project developed by student was initiated by the LabEx UnivEarthS in October 2012, with the technical and financial support of the CNES (French Space Agency) and the Paris Diderot Space Campus [6]. More specifically, it is a question of developing, by 2018, a 3-unit CubeSat satellite (i.e. with a size of 10x10x30 cm [7]). This satellite, called **IGOSat**, will carry 2 payloads (a dual frequency GPS to study the ionosphere and a scintillator for the study of radiation belts)

The scintillator will measure the energy spectrum of electrons and photons from the Van Allen belts within the satellite orbit. The project has the main components to carry out the development and test bench of this instrument (scintillator, photomultiplier, acquisition card).

The objective of this internship is to test and characterize the Engineering Model (EM) of the whole scintillator with gamma and electron sources. The student will have to generate the detector response matrix, which will make it possible to trace the incident energy from the measured energy of the particles.

Another part of the internship will be to write an algorithm for processing the data on board and to test on the data measured in the laboratory. These subjects will be studied in collaboration with the researchers and students of the project, and in particular with the PhD student currently working on the scintillator payload in the laboratory.

Bibliographie
[1] LabEx UnivEarthS : http://www.univearths.fr
[2] Laboratoire AIM : http://irfu.cea.fr/Sap/
[3] Laboratoire APC : http://www.apc.univ-paris7.fr
[4] Institut de Physique du Globe : http://www.ipgp.fr
[5] Université paris Diderot : http://www.univ-paris-diderot.fr
[6] Campus Spatial Paris Diderot : http://www.campusspatial-paris.fr
[7] CubeSat Informations: http://www.cubesat.org
[8] IGOSat Project : http://www.igosat.fr