

IGOSat Project

Internship proposal - 2018

Ionospheric radio-occultation payload development for IGOSat

Skills, key-words: instrumentation, radio occultation, functional test, GNSS, onboard software, ionosphere, GPS

Study level: 4th Year/ Master Degree

Duration : 4 months

Stipend : 570 € / 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 2019, 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 radio-occultation payload is a GPS receiver, measuring the phase of 2 signals to retrieve information about the Electronic Content encountered during the propagation. Using a specific software for data processing, it is possible to know the Total Vertical Electronic Content of the Ionosphere.

All the components of the Engineering Model are available. The tasks of the internship will be to take care of the integration of the payload within the EM platform, perform functional tests and supervise the development of the onboard flight software with a software engineer student.

In interaction with a team of several students, engineers and scientists, the student needs autonomy, precision and a good comprehension of both science and engineering at stake.

Bibliography

[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.campuspatial-paris.fr>

[7] CubeSat Informations: <http://www.cubesat.org>

[8] IGOSat Project : <http://www.igosat.fr>