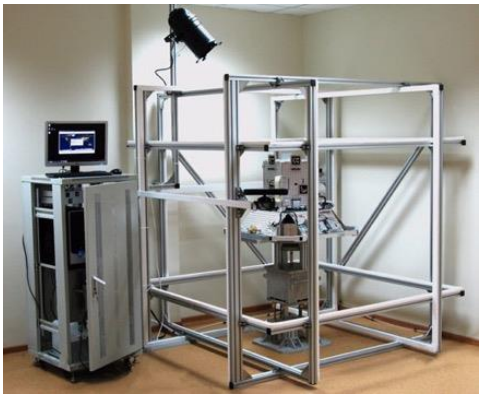
Development of an Attitude and Orbital Control System (AOCS) test bench

Context:

In space there is no atmosphere, a satellite cannot control its attitude via traditional means. A satellite is therefore equipped with an Attitude and Orbital Control System (AOCS).

An AOCS is a set of sensors such as: sun sensors, magnetometer, accelerometers, GPS and other sensors needed to know the attitude and position of the satellite. It also has magneto-torquers and reaction wheels when possible to change the attitude and orientation of the satellite.
The AOCS computer has all the algorithms needed to command the reaction wheels and magneto-torquer from the inputs of the sensors.
These algorithms and the hardware must be tested on ground to be sure that the satellite will react correctly when in orbit. To do so, we must develop an AOCS test bench, which will allow us to simulate the orbital environment in term of magnetism, Sun, lunar and Earth lightning and to compensate (or at least take into account) gravity. In this respect the test bench will be an air cushion platform (on which we will install the CubeSat or nanosatellite) centered in a Helmotz cage



AOCS testbed example – Helmotz Cage with air cushion plateform

Skills required:

- Background in physics, electronics, optics and magnetism,
- Integration,
- Tests.

Additional Information and contact:

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Level of studies: BSc, Master
Length of internship: 3 to 6 months
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