

Position determination and tracking of a cubesat during re-entry, using a laser system



We are looking for two motivated EM or EA-ICT master students.

Project Description :

The Aether Student CubeSat team brings together young Belgian engineers who are passionate about space technology. We are designing a CubeSat: a nano-satellite small enough to hold in your hand. In the past decade, the CubeSat standard has enabled countless new innovations in the space industry, and we are determined to uphold this tradition!

Aether is focusing on the area of re-entry: creating the technology that will allow future CubeSats to safely re-enter the atmosphere and land on Earth after carrying out their experiments in orbit. This will allow scientists to analyze samples and get even more results out of their experiments, and all this with the affordability and accessibility that come with the CubeSat platform!

Thesis description :

During re-entry, the cubesat follows a specific path, which is influenced by many different parameters. In order to track the cubesat during re-entry, a dedicated tracking station should be put in place. One of the techniques is developing a laser system, which uses a simple retroreflectors aboard the cubesat. A steerable setup transmits a laser beam towards this retroreflector during re-entry to keep track of the cubesat. Hence, a track record is created, which can be used for improving future modelling of re-entry trajectories. The aim of this thesis is to analyze and develop an initial laser beam setup station for re-entry cubesat trajectory monitoring and position determination.

Thesis objective :

The goal is to design a practical laser tracking station, capable of following a cubesat during re-entry. Currently, no clear view is available on the trajectory of these re-entry vehicles. The objective of the thesis is to contribute to infrastructure, capable of improving the re-entry trajectory models.

Profile :

- Control systems
- Laser optics
- Trajectory analysis

What do you gain ?

- A unique engineering experience within an exciting space mission.
- Create added value for your CV and the team.
- A team of students willing to help in any way possible.
- Be part of the team that will revolutionize the CubeSat platform.

If you are interested? Please contact us at recruitment@aetherspace.be .

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