

Internship in Flight Operations Division

Internship title: Impact of variable area modelling for drag on propagation accuracy for LEO satellites

Currently, most operators, including EUMETSAT, are considering a fix average frontal area of the spacecraft as input into their atmospheric drag model, when generating predicted ephemerides. That approximation is normally more than sufficient to ensure correct maintenance of the spacecraft within its operational orbital limits; however, that's not necessarily the case for Space Traffic Management operations, as any inaccuracy in orbital estimation may result into an inaccurate evaluation of a conjunction risk. It is therefore recommended to improve as much as possible the accuracy of the predicted ephemerides used for these operations by considering an accurate variable value of the frontal area of the spacecraft as input into the atmospheric drag model.

The main goal of this internship would therefore be to implement a prototype of this variable area model into a reference propagator, in order to evaluate the benefit of this model in terms of accuracy of the predicted orbit versus the consolidated estimated orbit; the accuracy provided by the currently used fixed area model would be used as benchmark value.

If the observed benefit is important, a second step would be to implement platform dependent models to compute the variable area profile from the predicted attitude of the satellite and the orientation of the movable parts (e.g. the solar array). This improvement is expected to be particularly beneficial for missions with large movable parts, such as Metop Second Generation, with large attitude changes, such as CO2M and flying at very low altitude, such as Sterna.

Duties

- Familiarization with the SW modules available in EUMETSAT for LEO satellite orbit propagation.
- Selection of most suitable orbit propagation SW
- If improvements observed, development of mission specific modules for generation of the variable drag area model from the models describing the



LOCATION

Darmstadt, Germany



QUALIFICATIONS

The internships are open to bachelor and master students with mandatory internship requirements in relevant disciplines covering orbit mechanics, including good background/development in mathematics and applied sciences.



LANGUAGES

The official languages of EUMETSAT are English and French. It is necessary to be able to work effectively in English.



DEADLINE

19 November 2026

module for prototyping of a variable drag area model (i.e. drag area evaluated as function of the time of the propagation).

- Analysis of propagation accuracy using the new variable drag area model versus the result provided by the equivalent fixed drag area model.

platform attitude and the displacement of the movable parts (e.g. solar array) for the most interesting missions (CO2M, Metop Second Generation, Sterna).

- Document and synthesize results accordingly in a document report and an end-of-internship presentation

Skills and Experience

- Have the ability to work effectively in English;
- Be computer literate;
- Be intrinsically motivated and curious about the internship subject;
- Be able to work independently and collaboratively;
- Have the ability to take the initiative in researching ideas;
- Have the ability to collect, collate, conceptualize and present information clearly.

Additional advantageous requirements:

- Knowledge in orbit mechanics;
- Familiarity with Linux systems and with Python would be desired.

Employment Conditions

Length of internship: **3 months**

Anticipated start date: **2027**

The internship will require a non-disclosure agreement and potentially a basic background check for the intern, due to the sensitivity of the provided information.

No salary is paid to interns who are still in studies, however a daily allowance and contribution to travel / accommodation costs may be provided.

Interns may be granted a daily allowance of EUR 25 per day, relocation cost reimbursement of up to EUR 400, and accommodation cost reimbursement of up to EUR 1000 per month.

Interns are responsible for providing their own health and accident insurance and for finding their own accommodation in Darmstadt.

Consideration may also be given if the internship is not a mandatory part of curriculum, for a maximum duration of three months.

EUMETSAT is committed to providing an equal opportunities work environment for men and women.

Please note that only nationals of EUMETSAT Member States may apply. The EUMETSAT Convention requires that Staff shall be recruited on the basis of their qualifications, account being taken of the international character of EUMETSAT.

About EUMETSAT

EUMETSAT is Europe's meteorological satellite agency. Its role is to establish and operate meteorological satellites to monitor the weather and climate from space - 24 hours a day, 365 days a year. This information is supplied to the National Meteorological Services of the organisation's Member States in Europe, as well as other users worldwide.

EUMETSAT also operates several Copernicus missions on behalf of the European Union and provide data services to the Copernicus marine and atmospheric services and their users.

As an intergovernmental European Organisation, EUMETSAT has 30 Member States (Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, The Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.)

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