



**Master Thesis Work**

of Choose title Name, Surname

**Untersuchung der Randbedingungen für den Satellitenbetrieb eines VLEO-Satelliten**

**Investigation into boundary conditions regarding satellite operations of a VLEO satellite**

Motivation:

The ATLAS research project at the University of Stuttgart aims to investigate the very low earth orbit (VLEO). The aim is to increase the lifetime of VLEO satellites by one order of magnitude. As part of this research project, the fundamentals of VLEO satellite operations are also being investigated. This is based on the expertise gained during the two still actively operated LEO satellite missions *Flying Laptop* and *EIVE* of the University of Stuttgart.

For the preparation of satellite operations of new satellites the boundary conditions of each system have to be understood. LEO satellite missions are very well understood these days, which is why the boundary conditions of the newly developed satellite platform predominate the preparations. In the VLEO regime, however, additionally external boundary conditions e.g. environmental influences are currently researched.

The aim of this master thesis is to investigate boundary conditions for VLEO satellite operations. This shall include internal (AOCS, EPS, COM,...) as well as external (environment, ground station locations, orbit,...) influences. For the identified boundary conditions suitable mitigation measures have to be identified in order to understand how these different influences can be handled and/or completely mitigated if necessary.

Task description of the Master thesis work:

- Familiarization with LEO satellite operations and usual boundary conditions
- Research on VLEO satellite missions and encountered boundary conditions
- Analysis of external boundary conditions depending on external influences e.g. environment
- Analysis of internal boundary conditions depending on the satellite design
- Analysis of potential mitigation measures for the identified external boundary conditions
- Analysis of potential mitigation measures for the identified internal boundary conditions
- Documentation

Supervisor: Markus Kranz, Philipp Maier

Starting date: as soon as possible

Submission until: [Click for date](#)

**Acknowledgement of receipt:**

I hereby confirm that I read and understood the task of the master thesis, the juridical regulations as well as the study- and exam regulations.

\_\_\_\_\_  
 Date  
 Prof. Dr.-Ing. Sabine Klinkner  
 (Responsible Professor)

\_\_\_\_\_  
 Date  
 Signature of the student

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