

Study and Implementation of Highly Energy Efficient LIM Control Strategies

Short Description

Global rise in mobility brings traditional modes of transport to their limits. Vacuum Transportation enables an efficient and safe way of transport. Vehicles, so-called pods, travel at high speeds on a rail through a low-pressure tube in order to minimize drag.

ETH Zurich's Hyperloop Team Swissloop participated with other university teams in Elon Musk's Hyperloop Pod Competition for three consecutive years. While so far the focus has been maximum acceleration for the competitions, Swissloop aims to shift research focus on more viable prototypes. This approach includes the development of components that achieve the required performance, but also work reliably and safe.

The goal of this thesis is to investigate control strategies for Linear Induction Motors (LIMs) and develop such a strategy while focussing on energy efficiency. In addition, performance-critical parameters should be isolated in order to improve future motor prototypes. A simulation of the results should demonstrate the applicability and performance.

The results of this thesis aim to increase performance and energy efficiency of future motor prototypes. These motors could either be incorporated into pods or into the test track built by the EuroTube Foundation. This thesis is conducted at the Institute ??? in collaboration with EuroTube and Swissloop.

Type	Semester thesis / Master thesis
Partner	ETHZ, EuroTube Foundation, Swissloop
Start date	tbd
End date (planned)	tbd
Student(s)	tbd
Internal supervisors	Fabio Dubois, fabio.dubois@eurotube.org Yvan Bosshard, yvan.bosshard@swissloop.ch
External supervisors	???

Work packages

- Literature review of LIMs and Control Strategies
- Isolation of performance critical parameters
- Improvement of existing strategies or development of alternatives
- Implementation/Simulation of results
- Documentation and writing of report

Requirements

- High motivation and interest in the topic
- Able to work independently and be creative
- Experienced in control theory
- Basic understanding of electro magnetism
- Basic skills in Simulation (MATLAB/Simulink, Simplorer, etc.)

Application

Please email your CV and transcript to tbd



Planned AlphaTube Infrastructure, Collombey-Muraz, Switzerland



Swissloop Pod Claude Nicollier (2019)