

Investigation of long primary linear motor types and topologies for a vacuum transport application

Short Description

EuroTube Foundation is a Swiss non-profit research organization for the development of vacuum transport technology, also known as Hyperloop. Our main current missions are to develop a 120m Hyperloop test track (DemoTube) in canton Zurich, Switzerland until 2024, and a 3km test track (AlphaTube) in canton Valais, Switzerland until 2026.

In this thesis the student will investigate different linear motor types and topologies for the future 3 km AlphaTube vacuum transport demonstrator. The track-side (long primary) motor will be 400 m long and will propel the vehicle to 900 km/h, reaching a peak power of 10 MW. Possible motor types of interest are the permanent magnet synchronous motor and the synchronous reluctance motor, while both double-sided and single-sided topologies can be investigated. The designs will be compared to the existing linear induction motor design of EuroTube for efficiency, cost and optimal usage of materials. The motor designs should be verified in a 2D or 3D finite element analysis software.

Partner **XX**, EuroTube Foundation

Start date **XX.XX.20XX**

End date (planned) **XX.XX.20XX**

Student(s) **XXXX XXXX**

Internal supervisor **Ioannis Stavropoulos** , ioannis.stavropoulos@eurotube.org

External supervisor **[NAME]**, **[Email address]**

Work packages

- Literature review on linear and rotating electrical motors
- Derivation of electrical and magnetic equivalent circuits based on analytical formulas
- Development of a finite element model for each motor topology
- Simulation and comparison of the topologies based on performance, efficiency and material cost

Requirements

- Electrical engineering master student
- High motivation and interest in electrical motors / finite element simulation
- MATLAB/FEM knowledge desirable

Application

Please email your CV and transcript to ioannis.stavropoulos@eurotube.org

