

Cooling of electrical linear drive propulsion in hyperloop systems

Short Description

Hyperloop is the next evolution of rail-based transportation, combining the speed of aircraft and the efficiency of the railway industry. The hyperloop concept uses a partial vacuum environment to reduce air drag in addition to a contactless support and guidance system and an electrical linear drive propulsion. EuroTube pursues the dual drive concept where a high power launcher is sitting on the track to accelerate and decelerate the vehicles whenever speed has to be changed. And additionally an efficient onboard motor on every vehicle to maintain cruising speed. In both cases linear motion is generated by current, cleverly conducted through coils, to produce an electromagnetic force. Hereby the conductors are heating up due to joule heating and have to be cooled to ensure efficiency of the motor. The aim of this work is to design a cooling system to keep the motor at operation temperature.

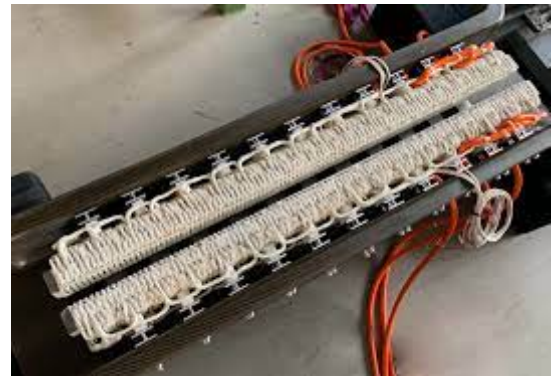
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Possible work packages

- Literature review on cooling concepts for high power electrical motors
- Study the effect of the paschen curve on the motor temperature
- Energy flow and thermal modeling of a linear electrical drive
- Optimization studies on thermal management of linear electrical drives
- Cooling concept for the conducting coils
- Build a prototype to prove cooling system for conducting coils

Requirements

- High motivation and interest in the topic
- Able to work independently and be creative
- Methodological and goal-oriented working behavior
- Heat source network modeling
- Knowledge in thermodynamics and cooling applications
- Knowledge about hyperloop technologies is beneficial



Application

Please email your CV and transcript to manuel.haeusler@eurotube.org