Master's Thesis

in collaboration with
Schunk Transit Systems - Salzburg

Dynamic simulation of pantographs and catenary according to EN50318

Description

An essential component of modern railway systems, especially for high-speed trains, is the pantograph mounted on the roof of the train. The pantograph maintains continuous contact with the overhead catenary to transmit electrical energy reliably, even when the train displaces vertically due to track irregularities or curves. Together with the catenary, the pantograph forms a coupled oscillating system whose dynamic interaction directly affects the quality of the electric current collection, operational safety, and component wear. To ensure safe and efficient operation, a standardized validation procedure has been defined, which includes both measurements and numerical simulations.

To validate new simulation models, the EN 50318 standard defines a standardized approach that includes the use of reference models and measurement data. The **aim** of this master's thesis is to develop a fully parameterized finite element reference model, which fulfils the requirements of the EN 50318 and can serve as a basis for the development, testing, and verification of new simulation methods. After the system has been modelled, the simulation results are compared with the defined reference models and measurement data. The specified result ranges provided in the standard must be met to ensure that the developed model is valid and verified according to EN 50318.

Remuneration provided.

Tasks

- Review of literature and standards
- Create a model (ANSYS, PYTHON, etc.)
- Verify results with EN 50318

Requirements

- Interest in structural dynamics
- Basic knowledge in programming and FEM

Contacts

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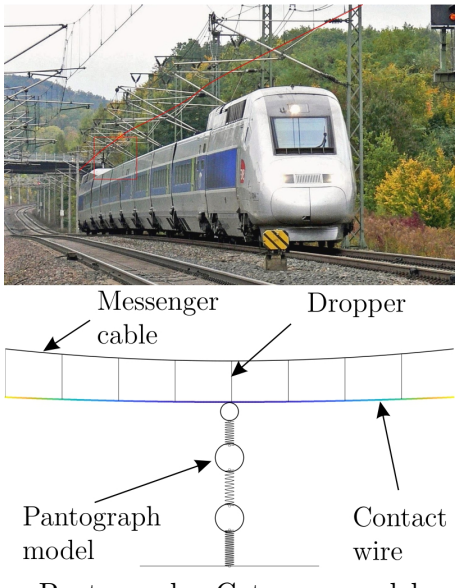

Pantograph - Catenary model