

Influence of stiffness and contact modelling on catenary–pantograph system dynamics

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Abstract-

This article is concerned with dynamic simulation of catenary–pantograph interaction using simplified models. The paper proposes the improvement of these models by considering an enhanced catenary stiffness model and contact modelling based on lagrangian multipliers. The influence of both enhancements is discussed and investigated by means of an exhaustive comparison between most common simplified models and the method proposed herein. The results show that catenary stiffness modelling plays a central role at low train speed. Contact modelling allows a more accurate description of contact force during contact losses and is the critical factor at high train speeds.

Index Terms-

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