

**Title:** Environmental and track perturbations on multiple pantograph interaction with catenaries in high-speed trains

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**Abstract:** The top velocity of high-speed trains is generally limited by the ability to supply the proper amount of energy through the pantograph-catenary interface. The deterioration of this interaction can lead to the loss of contact, which interrupts the energy supply and originates arcing between the pantograph and the catenary, or to excessive contact forces that promote wear between the contacting elements. Another important issue is assessing on how the front pantograph influences the dynamic performance of the rear one in trainsets with two pantographs. In this work, the track and environmental conditions influence on the pantograph-catenary is addressed, with particular emphasis in the multiple pantograph operations. These studies are performed for high speed trains running at 300 km/h with relation to the separation between pantographs. Such studies contribute to identify the service conditions and the external factors influencing the contact quality on the overhead system. (C) 2013 Elsevier Ltd. All rights reserved.

**Author Keywords:** Railway dynamics; Multibody systems; Pantograph-catenary interaction; Contact forces; Cross-wind; Track irregularities

**KeyWords Plus:** Contact force models; Railway dynamics; Wear; Simulation; System; Transitions; Prediction; Vehicles; Wire

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