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电力系统

基于电磁暂态分析的高速铁路牵引网谐波模型及谐波特性分析

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摘要：

本文在电力系统多导体传输线（MTL）模型的基础上，结合了牵引网等值电路的自身特点，利用多导体降阶方法，并通过PSCAD/EMTDC仿真软件建立了牵引网的谐波模型。采用某高速客专的典型数据，对牵引网中的谐波电流放大现象和规律进行仿真分析和验证。通过对牵引网长度，机车位置等因素与牵引网发生谐波电流放大的关系的研究，证明了本文所建模型的正确性和灵活性，也为今后的牵引网谐波分析提供了理论依据和科学指导。

关键词： 牵引供电系统 多导体传输线 牵引网 降阶理论 谐波谐振

Modelling and Characteristic Analysis of Harmonic in High-Speed Railway Traction Network Based on PSCAD/EMTDC Platform

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Abstract:

this paper proposed a harmonic models in the traction network through PSCAD / EMTDC, based on the power system multi-conductor transmission-line (MTL) models with the characteristics of equivalent circuit of traction network, which used multi-conductor reduction method. The phenomena of amplification of harmonic current in the traction network was simulated and verified by using an electrified railway typical data.. Through studing the relationship with amplification of harmonic current and some factors such as traction network length, train location and different traction network location, accuracy and flexibility of the models in this paper was proved, it also provided a theoretical basis and scientific guidance for future traction network analysis.

Keywords: traction power supply system multi-conductor transmission line (MTL) traction network order-reduction method harmonic resonance

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