

Aspects of Train Systems Simulation

Martin R. Kuhn¹ Yang Ji² Bo Wang² Xiang Li² Bohui Liu² Feng Sha² Dunwen Gan³ Feng Gao³

¹Yuanda SimTek GmbH, Germany, martin.kuhn@yuandasimtek.de

²SimTek CO, China, {yang.ji ,bo.wang, li.xiang, bohui.liu, feng.sha}@cnydsimtek.com

³BEIJING ZONGHENG ELECTRO-MECHANICAL TECHNOLOGY DEVELOPMENT CO, {gandunwen, gaofeng}@zemt.cn

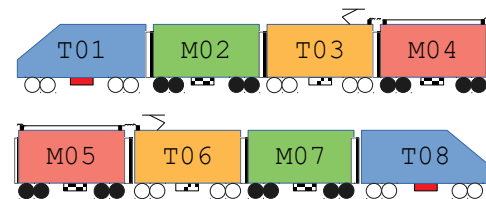
Abstract

This paper present needs and implementations for system modeling of high speed trains with focus on the Beijing-Zhangjiakou Intercity Railway.

Typical scenarios which are relevant in systems design are

- Vehicle energy consumption estimation for systems and supply network optimization
- Electric grid harmonic estimation for topology and filter selection
- Traction system thermal capacity estimation for cooling system layout and control of power reduction
- Driven cars stability estimation

The implementation of the library with Modelica is discussed and demonstrated for the rail-wheel contact and mechanical, logical, electrical and thermal systems, with special attention to the rail-wheel contact and electrical power off-take.



- Auxiliary current converter, battery & battery charger
- ▣ Transformer
- ▣ Traction current converter
- Trailing axis
- Driven axis

Figure 1. Schematic diagram of traction system.