Semi-Deterministic Propagation Modeling for High-Speed Railway

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Abstract:

A large number of empirical, statistical, and deterministic models have been investigated for the propagation in the high-speed railway. However, the semi-deterministic model with an acceptable degree of accuracy, little information requirement on the environment, and less computational time is still a gap. This paper presents a semi-deterministic propagation model of the high-speed railway for the first time. After the analysis on the characters of high-speed railway, the Extended Hata model and multi-edge diffraction models are conjunctively utilized to constitute the semi-deterministic model. The proposed model achieves higher accuracy than empirical and statistical models, but with totally free sources and very easy to be used. Therefore, this model can be easily implemented and adopted by the design institutes of high-speed railway or other researchers to conduct realistic assessment of system performance, network planning, and deployment issues for train control communications systems.