

**Frequency Range Expansion into Elastic Vibration of the System of  
Hardware In the Loop Simulation for Railway Vehicles**

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This report describes the way to enhance of the frequency range of the developed Hardware In the Loop Simulation system (HILS) in order to evaluate the elastic vibration of the carbody for a railway vehicle. It is necessary to review the implementation methods for the frequency range expansion in term of both of its actual component part and computer simulation part. In this paper, we introduce two different types of test equipment which were produced for the use in low and high frequency range, respectively, and we confirmed that it is possible to execute the excitation tests for low frequency and high frequency separately. In addition, we propose an identification procedure that generates a high accuracy model which works in real time for the simulation using stationary testing data. The prediction results show good agreement with the validation data by excitation tests on a rolling stock testing plant at Railway Technical Research Institute.