

# Development of Analysis Method on Rail/Wheel Rolling Contact by Large-Scale Parallel Computing

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## Abstract

Running the railway vehicle, the deterioration on the rail or wheel, such as wear or crack can be caused, by the slip along with vibration and impact on the contact patch between rail and wheel. High frequency load response of the order of kHz is considered one of the causes on these phenomena. Therefore, it is necessary that the mechanical behaviors occur on the contact patch estimate with accuracy.

In this study, three-dimensional finite element analysis considering rolling contact by large-scale parallel computation is conducted to solve the deterioration mechanism between rail and wheel. As high-speed calculation on the large-scale fine model can be performed by the Earth Simulator, it is considered that the dynamic response of the real phenomena is evaluated exactly.

**Keywords:** large-scale simulation, finite element analysis, rolling contact, dynamic response, railway