

### **Evaluation of Dynamic Behavior of the Wheel-Rail Rolling Contact**

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Contact between rail and wheel takes place in a very small area called “contact patch” . The rail and the wheel are exposed to a large impact load there. To clarify the initiation mechanism of the deteriorations of the rail or the wheel such as wear or crack, it is necessary to evaluate the mechanical behavior inside the contact patch under running impact load of the order of kHz. In our study, a dynamic rolling contact analysis method was developed based on three-dimensional finite element structural analysis software FrontISTR. For the verification of our methods, the analysis results were compared with those of the prior research and theoretical solutions. It is shown that our analysis results agree well with respect to the profile of the contact patch and the stress distribution. The result of the detailed distribution of tangential contact force is also reported.