

## **Development of Models of the Contact Lines and Pantograph for Railway Lines of Various Alignments**

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An analytical method by three dimensional non-linear FEM for determining the static geometry of the overhead contact lines (OCL) installed on the railway lines of the various alignments including curve sections (OCL analytical method), and another one for analyzing dynamic behavior of a pantograph were respectively developed. As for the OCL analytical method, static geometry of the OCL which changes depending on the ambient temperature can also be calculated. This paper shows the outline of their algorithms and indicates the calculation results.