## Numerical Investigations on Validity of Method for Measuring Wheel-Rail Lateral Contact Position with Instrumented Wheelset Using Shear Strains Induced on Wheel Web

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Instrumented wheelsets are widely used in the railway industry to measure wheel-rail interaction forces, which are crucial factors in assessing running safety. Information on the lateral contact position between wheel and rail is also an important factor in assessing wheel-rail contact conditions, such as the friction coefficient at the contact point. In the previous studies, the authors proposed a method for measuring the lateral contact position using an instrumented wheelset using shear strains on the wheel web and a signal processing procedure based on a frequency decomposition of the strain signal. In general, it is difficult to verify the measurement accuracy of the contact position under actual operating conditions of railway vehicles, since it is difficult to acquire comparative data of the contact position. In this paper, a numerical tool is developed to emulate the strain signals observed at the instrumented wheelset. This tool consists of a wheel deformation analysis based on finite element analysis and a vehicle dynamics simulation based on multibody dynamics. In addition, the proposed signal processing procedure is verified using the numerical tool.