

A Continuous Measurement Method of Wheel/Rail Contact Position Using Wheel Bending Strain

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This study proposes a method for continuously measuring wheel/rail contact position based on the measurement of the bending strain of wheel. The optimal placement of strain gauges was determined using finite element analysis. An instrumented wheelset was then fabricated with strain gauges attached at those positions, and a static load test was conducted on the wheelset. We have also developed a method for measuring contact positions by solving a nonlinear equation. This equation uses parameters derived from the relationship between load position and strain gauge bridge output obtained in the static load test. Running tests conducted with railway vehicles confirmed that the proposed method can measure the contact position continuously. Additionally, an evaluation using paint confirmed that the measurement accuracy in this test was ± 2 mm.