Residual Stress Evaluation of Railway Rails

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Rolling contact fatigue is one of the fatigue damages of the railway rails. A lot of researches have been made about the rolling contact fatigue based on the fracture mechanics. Rolling contact fatigue occurs by repeated contact stress at the railhead by running wheels. Contact stress generally forms compressive stress. Tensile stress helps to progress the fatigue failure and it decreases rapidly under the contact surface, so a lot of cracks usually stop at the depth of several millimeter. However, it finally breaks when the crack propagation in the rail changes the direction because the crack receives the cyclic bending stress of the rail and the influence of the tensile residual stress. In order to obtain the crack growth rate, the measurement of the residual stress distribution is needed. But, in Japan, the example of measuring the residual stress distribution of railway rails is a few.

In this research, it has aimed at the assistance of the inspection period and the cycle decision of the rail maintenance. For these purposes, the residual stress distribution in the railway rails was measured by using the X ray diffraction method and the strain gauge method, etc.

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I would like to publish this paper in **ICRS** proceedings.