

### **Autonomous Damage Detection System for Damage of Axle Bearings of Railway Car Bogies**

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Axle bearings of railway car bogies are important parts that support the running of the cars. It is desirable to detect damage to axle bearings at an early state. Therefore, an autonomous damage detection system (ADDS) was developed that does not require a power supply nor wiring and notifies axle bearing damage to the vehicle after detecting. The ADDS utilized an anti-vibration rubber with a built-in piezoelectric element and wireless transmitter; which was installed on the axle box. The damage detection performance of the ADDS was evaluated using a test machine. In the case of a damaged bearing, the power generated by the piezoelectric element built-in the rubber could drive the radio transmitter, and the damage could be notified.