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THIRD PRIZE

Markus Loidolt
Graz University

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The Detection of Squats (rail defects) using Existing Data Sources

Due to the increasing traction performance of powered axles coming along with the modal shift towards rail, increased rail fatigue is to be expected and, in many cases, already observed. One type of rolling contact fatigue damage that has gained prominence in recent years in many countries is squats. Untreated squats pose a risk of rail breakage due to vertical cracks. In addition, the typical indentations of the rail surface led to increased dynamic load inputs into the system. Detected early enough squats can be removed relatively easily using common rail surface treatment such as grinding or milling. However, detected too late, the only option is to exchange rails, which incurs additional costs. A measuring technique detecting squats at an early stage would thus lead to relevant cost savings. Therefore, this project tested the suitability for squat detection of existing data measured by the rail surface measuring system of ÖBB's measuring car for other purposes. The fine sampling rate leads to the assumption that the typical squat indentations on the rail surface ought to be recognizable by this measuring system. Furthermore, the assumption was confirmed during the initial evaluations. Currently, the research is evaluating details on false positive and false negative rates. It is pivotal to guarantee a reliable detection of squats and an accurate differentiation from other rail surface discontinuities (e.g., welded joints). Having achieved this, a network-wide implementation of this analysis is easily done, since the measuring car is surveying the network in a fixed schedule in any case.