

New approaches for mechanized rail testing

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The changes in the use and maintenance of track systems poses new challenges for the periodic mechanized in-service testing of rails using ultrasound and eddy current. The methods currently applied have been used since decades with only minor changes. To face the new challenges generated by modern drive systems, higher speeds, heavier loads adapted techniques have to be developed to detect new defect types and artefacts generated by new production methods. Especially the area where rolling contact fatigue takes place is under focus. Going beyond the standard conventional ultrasound setups used since the 1950 enables a more detailed detection and classification of rail defects and size estimation. Eddy current methods are applied for surface crack detection and head check depth quantification at the gauge corner of railway tracks. An extension of the tested zone to the running surface uncloses rail defect signal types other than head checks to be detected and estimated in type and size. For the automated evaluation of the recorded data algorithms based on artificial intelligence being trained based on simulation will be applied. Typically, the testing parameter vary depending on the track condition and the probe wear. To identify variables and parameters which have a significant influence on the overall performance of the test run modelling of the setup can be used. Actual developments will be presented in this talk.