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ASSESSMENT OF RUNNING SAFETY OF RAILWAY VEHICLES USING ACCELERATION DATA FROM AN ON-BOARD SYSTEM

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Summary: This work proposes the application of the simplified method outlined in the European standard EN 14363 as an indicator for assessing railway safety against derailment using acceleration data from an on-board system. The approach is applied to a railway vehicle through numerical simulations with a multibody model and a sensitivity analysis across different track irregularity scenarios, following the levels defined by European Standard EN 13848-5. The results demonstrate the vehicle's high sensitivity to different track irregularities levels, with greater acceleration amplitudes observed for higher peak values of rail irregularities. In the most severe scenario, corresponding to the safety limit, there is a high probability of a derailment occurring. Finally, it is concluded that speed reduction effectively mitigates high acceleration amplitudes, enhancing railway safety. In summary, the preliminary results highlight the potential of this simplified method as a track quality indicator and consequently assist railway operators to ensure a traffic running safety.

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