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Clarifications on the Damping Mechanism Related to the Hunting Motion of the Wheel Axle of a High-Speed Railway Vehicle

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Abstract : In order to explain the damping mechanism, related to the hunting motion of the wheel axle of a high-speed railway vehicle, a generalized dynamic model is proposed. Based on such model, analytic expressions for the damping coefficient and damped natural frequency are derived, without imposing restrictions on the ratio between the lateral and vertical creep coefficients. Influence of the travelling speed, wheel conicity, dimensionless mass of the wheel axle, ratio of the creep coefficients, ratio of the track span to the yawing diameter, etc. on the damping coefficient and damped natural frequency, is clarified.

Keywords : high-speed railway vehicle, hunting motion, wheel axle, damping, creep, vibration model, analysis.
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