

RESEARCH OF THE DYNAMIC PROCESSES OCCURRING DURING THE MOVEMENT OF A ROLLING STOCK

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One of the ways the rolling stock modernization of the Ukrainian railways is the introduction of decision support systems for drivers. Driving a train using such systems is not only more economical due to lower energy costs, but also safer and more comfortable for passengers.

In existing systems, control suggestions are based on route maps, which are calculated in advance using the method of traction calculations, which does not allow taking into account a number of parameters such as weather conditions, condition of the control object and rails. To take into account these parameters, the control signal must be adjusted also at the stage of the train movement. This can be done by supplementing the existing computer control system of the object model, on which the control signals will be calculated [1].

It is proposed to supplement the existing mathematical models of diesel train movement with equations that take into account the undesirable oscillating movement of cars and their components. These oscillating movements can lead to serious incidents on the railway, causing damage to the components of the train and railway track [2].

The study considers the main types of oscillations of cars, the reasons for their occurrence and their possible impact on rolling stock. The developed mathematical model is presented, which includes the equation of wobble and lateral removal of the car and wheel pairs, and the simulation model is built on its basis. The data obtained from the simulation model can be used to adjust the control effects of the computer rolling stock control system.

References: 1. *Заковоротний А.Ю.* Синтез автоматизованої системи управління рухомим складом на основі геометричної теорії управління та нейронних мереж: дис. ... д-ра техн. наук: спец. 05.13.07. Нац. техн. ун-т "Харків. політехн. ін-т". – Харків, 2017. – 433 с.
2. *Дмитрієнко В.Д.* Проблеми забезпечення високошвидкісного перевезення пасажирів залізничним транспортом України / В.Д. Дмитрієнко, О.Ю. Заковоротний, М.В. Мезенцев // Інформатика, управління та штучний інтелект, Харків – Краматорськ, 2021. С. 33-34.