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Title: **The method of assessing the impact of the (CWR) track state on the possibility of its buckling**

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The transport tasks currently assigned to rail transport necessitate continuous development and improvement of the structure and diagnostics of the railway track. These tasks result mainly from changes in the operating conditions, e.g. from the need to increase the maximum speed of trains, increase the permissible axle loads. An important element is the operational reliability which determines the economy and safety of rail transport. Also, the recently increased requirements related to the protection of the natural environment impose further criteria to which modern technologies in the construction of railways should be adapted.

This dissertation presents the proposition of the author's method of assessing the condition of the contactless track for the possibility of its buckling during operation. For the development of this method, among others, experimental tests carried out by the author of the dissertation carried out on the section of the non-contact track of the Warszawa Wschodnia - Warszawa Centralna line. The selection of the test section was made due to its location - variable insolation, rail temperature differentiation, variety of passing units and thus different axle load and high frequency of traffic on the tested railway line. Measurements of the rail temperature and the calculation of longitudinal forces on the test section were carried out over one year, in the years 2019-2020. In the course of the research, data was obtained, which were later used to determine the thermal force occurring in the rail and to verify the proposed method. In addition to the experimental tests, visual observations of the condition of the track infrastructure of the studied section were also carried out. The obtained knowledge was used to prepare an algorithm for the developed method supporting decision-making in the event of a possible buckling of a rail in a contactless track and counteracting its effects. The tests and observations carried out during the first year confirmed one of the hypotheses that the proper maintenance of the contactless track prevents its buckling.

The scope of the dissertation covers the issues described in nine chapters. The first part of the work (chapter 1) presents the status of the problem and the formulation of the research problem. Chapter 2 and 3 is a review of the literature on the problems associated with the non-contact track, as well as its contemporary construction. Chapter 4 presents the thesis, purpose and scope of the work. The next chapter (chapters 5 and 6) presents the experimental tests and operational loads on the analyzed section of the railway line tested. Chapter 7 describes the proposition of the proprietary decision support method in the process of maintaining the contactless track. Chapter 8, in turn, presents the results of experimental tests performed on the analyzed section of the railway line. The last part of the work (chapter 9) contains a summary with conclusions and directions for further research.