

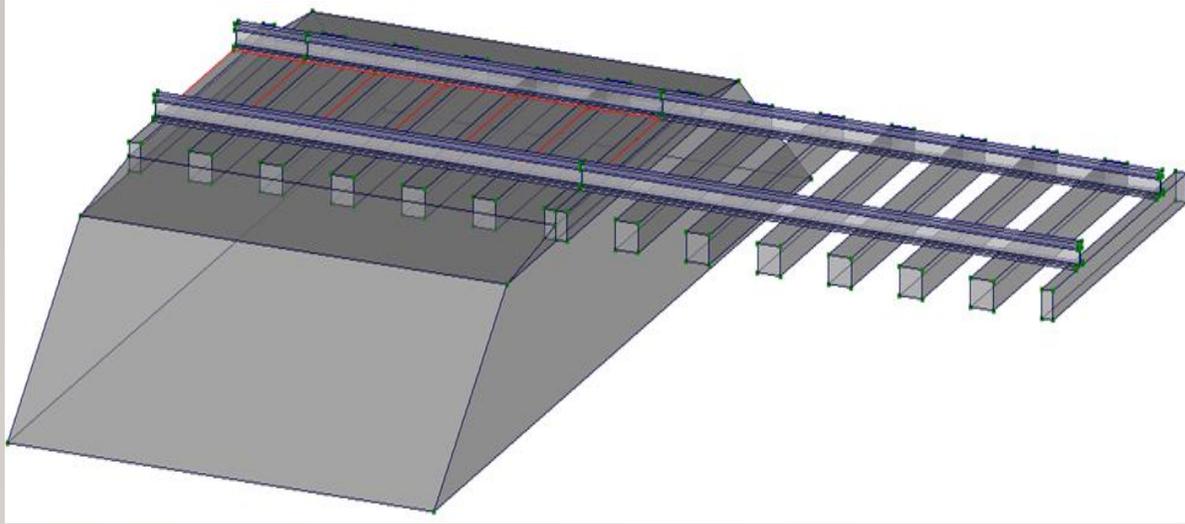
# SIMULATING OF THE HEAT CONDUCTION PROCESSES AND THEIR IMPACT ON THE STRESS-STRAIN STATE OF THE CONTINUOUSLY WELDED RAIL STRUCTURE

---

Z FAZILOVA<sup>1</sup>, A LOKTEV<sup>1</sup> AND V SHAPRAN<sup>2</sup>

<sup>1</sup> RUSSIAN UNIVERSITY OF TRANSPORT (MIIT) | 25 | 90 CHASOVAY, 22/2 MOSCOW, RUSSIA

<sup>2</sup> VORKUTA PERMANENT WAY DIVISION OF THE NORTHERN INFRASTRUCTURE  
DIRECTORATE OF JSC «RZD», VORKUTA, WORKING TOWN 1ST, PMS BASE | 69905, RUSSIA



In this research, we propose a railway track model, in the form of a flat structure, characterized with the properties of cylindrical anisotropy and deformed not only because of dynamic loads applied from the rolling stock, but also from thermoelastic processes due to uneven heating of separate structural track elements. The propagation process of longitudinal, transverse and thermoelastic waves, spreading from the wheel and rail contact area is considered.

# THE DEPENDENCY OF THE VERTICAL MOVEMENT OF THE ASSEMBLED RAILS AND SLEEPERS ON THE IMPACT OF THE ROLLING STOCK WITH REGARD TO THE TEMPERATURE VARIATION

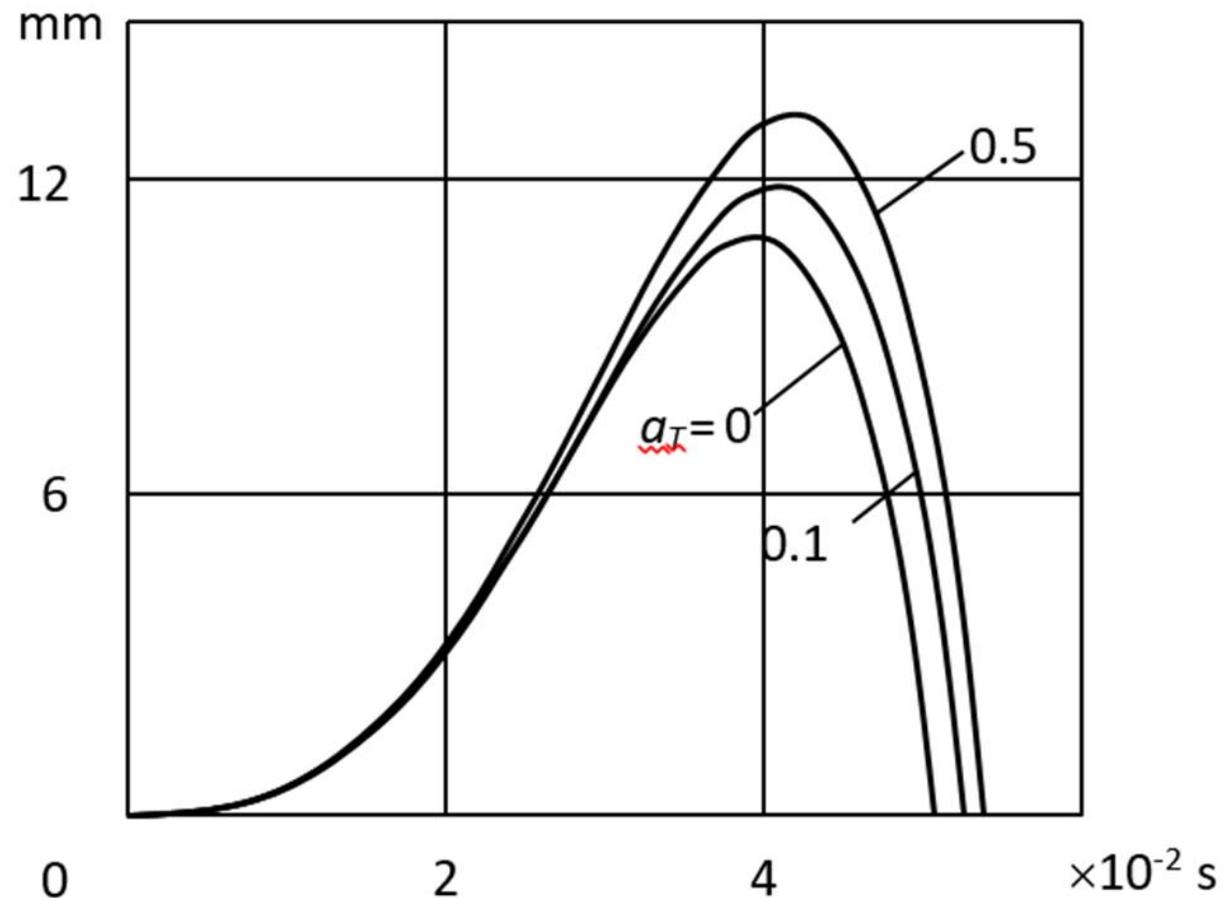


Figure 2 demonstrates the dependencies of the dynamic deflection on time for different values of  $a_T$ , which are indicated by numbers at the curves (the value «0» means that heat propagation is not regarded, «0.1» - a non-frozen roadbed, «0.5» - a complete frost penetration of the roadbed on which the assembled rails and sleepers are laid). It is seen in Figure 2 that an increase in the temperature coefficient leads to an increase in the dynamic deflection at the point of the wheel impact on the rail.

- 
- The analysis of the obtained graphical dependencies shows that the temperature wave is ahead of elastic impulse waves, and the processes of heat propagation in the permanent way can have a significant impact on the geometric and kinematic characteristics that describe the stress-strain state of the railway track. If we take into account thermoelastic processes in the permanent way, then the dynamic deflection increases under the point of load application of the set of wheels.