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ESTIMATED STABILITY OF MAGNETICALLY LEVITATED MOTION OF TRANSPORTATION SUPERCONDUCTING-MAGNET SYSTEM VEHICLE ALONG A PLANE TRACK STRUCTURE

A magnetically levitated motion of the vehicle of an electrodynamic system with a plane track structure can be realized in the systems with two or four lines of the track contours as illustrated by studies. Based on the concepts associated with small amounts of a non-ferromagnetic material for the track contours, the possibility of a magnetically levitated motion in the case that one line of the track contours is stacked on a plane track structure may be of interest. To attain this, a structural arrangement of a transport system is proposed. In this case the body rests on two bogies using the elastic and viscous members in vertical and transverse directions. The 8 superconducting square magnets whose longitudinal sides are located above the longitudinal sides of the track contours and 16 superconducting magnets are mounted on the bottom surfaces of bogies. Novelty lies in the possibility of applying one line of the track contours for a plane track contour. Based on the solution of the differential equations describing the motion of vehicles and their 3D oscillation, as well as variations in current in the track contours, the stability and vibratory loads of the magnetically levitated motion of the vehicle along straight and curved paths of the track are estimated. A conclusion is made that the proposed structural arrangements of a transport system are efficient.

Keywords: *electrodynamic transportation system, plane track structure, stable motion, superconducting magnets, curvature of track.*

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