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Application of Numerical Methods for Analysis of Propagation of Vibrations Generated by Moving Load

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Two numerical methods are presented to analyze dynamic response of the free field nearby railway lines induced by the specific moving loads acting on the surface of a layered and homogeneous halfspace with different material properties. A three dimensional (3D) modelling approaches are performed by Thin Layer Method / Flexible Volume Method (TLM / FVM) and by Boundary Element Method (BEM). Both simulation models based on substructuring approach employ frequency domain algorithms. The validity of each method is demonstrated by comparison with results of analytical solution. An extensive numerical investigations have been carried out on the influence of different parameters on the effectiveness of open trench barriers at the ground surface in reducing adverse effects of high frequency vibrations.

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