Abstract:

Train-induced ground vibration is numerically analyzed using the analytical and Finite Element Methods (FEM) in this thesis. Varieties of open trenches including partial and full length ones with different geometries are employed as vibration mitigation strategies. Ground is modeled by multiple soil layers and the train load pattern is simulated by series of successive moving loads. A parametric study is then carried out after verification of the numerical model. Effects of different parameters including the trench type, size and geometry and the train speed on the vibration mitigation level are investigated. The operational speeds are set to be in vicinity of the Rayleigh wave propagation velocity. Two types of active and passive trenches are considered with three different geometries of rectangular, triangular (wedge) and circular cross sections.

Keywords: Vibration Mitigation, Trench, Railway Track, Finite Element Method.

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Effects of the Trench Properties on Vibration Mitigation Level in High-speed Railway Tracks

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