

Sensitivity analysis of track parameters on train-track dynamic interaction

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Dynamic behavior of railway tracks when trains are running is influenced by several factors, i.e. rolling stock, the components of superstructure and their specifications. Usually, features like the sleeper spacing, rail pad stiffness, ballast damping and stiffness have an effect on the dynamic response of the track. The best method to study the dynamic behavior of the track is to model the track assembly and the train as a whole and carry out an analysis of dynamic interaction. Such analysis makes the identification of the track's dynamic behavior easier and helps to anticipate the deterioration of the track elements, and determines the effects of increase or decrease of mentioned parameters. This paper presents track-train dynamic interaction without considering irregularity of the rail face. A sensitivity analysis was carried out on the selected model. The analysis was undertaken with the view of varying one of the mentioned parameters and the results were presented to further identify the deterioration of the track elements. The results indicate that reducing sleeper spacing, rail pad stiffness, ballast stiffness, and increasing ballast damping reduces wheel-rail, rail-sleeper, and sleeper - ballast contact forces. © 2008 The Korean Society of Mechanical Engineers and Springer-Verlag GmbH.