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The influence of cable slackening on the stiffness computation of railway overheads

O. López García; A. Carnicero López; V. Torres Toledo; J.R. Jiménez Octavio

Abstract-

This article is concerned with the effect of cable slackening on stiffness computation of railway overheads. A previous model based on the catenary equation serves as the basis to include cable slackening. The influence of cable slackening is highlighted by comparing both models. A discussion of the comparison between the cable slackening model and traditional finite element formulations is presented. Although the method presented is applied to railway overheads, this methodology can be easily applied to general vertical cable nets. The proposed method shows good agreement with finite element results and the computational time is greatly reduced. The main influence of cable slackening is the smoothing of stiffness distribution at the local vicinity of the slackening dropper and consequently reducing the average stiffness of the railway overhead.

Index Terms- Railway catenary stiffness, Cable slackening, Nonlinear analysis

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