

DYNAMIC RESPONSE OF RAILWAY TRACKS IN TUNNEL

Tien Hoang¹, Denis Duhamel¹, Gilles Foret¹, Hai-Ping Yin¹, Patrick Joyez²
and Raphael Caby²

¹ Université Paris-Est, Navier (UMR 8205 ENPC-IFSTTAR-CNRS), École Nationale des
Ponts et Chaussées, 6 et 8 Avenue Blaise Pascal, Cité Descartes, Champs-sur-Marne,
77455 Marne-la-Vallée Cedex 2, France

Email: tien.hoang@enpc.fr (T. Hoang), denis.duhamel@enpc.fr (D. Duhamel),
gilles.foret@enpc.fr (G. Foret), hai-ping.yin@enpc.fr (H.P. Yin)

² Eurotunnel Group, BP no. 69, 62904 Coquelles Cedex, France.

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Periodically supported beam subjected to a moving load is often used for modeling the railway dynamics and analytical solutions have been developed for such modeling [1], [2]. More complex models can be constructed by including supports with damping or non-linear stiffness elements. This study deals with the dynamical modeling of non-ballasted railways, especially railways in tunnels. The model is developed as a dynamical system of multi-degree of freedom. Under the periodic assumption on the reaction force of the supports, the equation of motion for a periodically supported beam subjected to a moving load has been written. Then the Fourier transform has been used to solve this equation in case of damped supports. Analytical solutions have been established for the motion of the wheel and rail and also for the reaction force of the supports. The analytical solutions have been compared with in situ experimental measurements. The comparison shows that the theoretical results agree well with the measured results if damped supports are included in the model.

REFERENCES

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