

Séminaire du laboratoire PIMM

Jeudi 27 février 2020 à 13h00 en Amphi ESQUILLAN

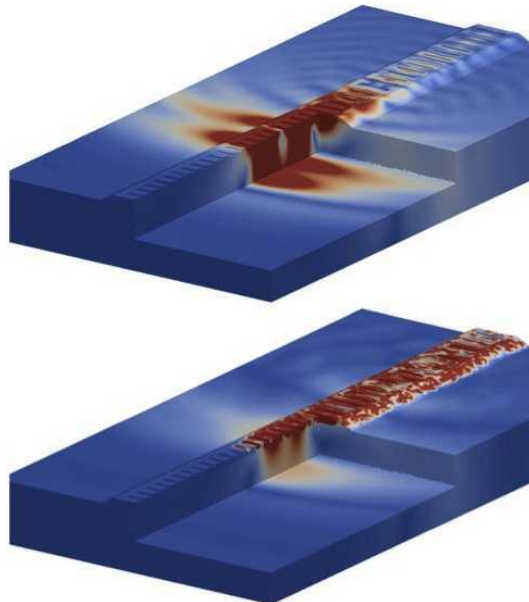
Dr. Régis COTTEREAU

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présentera dans le cadre du séminaire ses travaux intitulés :

Wave propagation in elastic randomly-fluctuating models of ballasted railway tracks

The behavior of waves going through a disordered heterogeneous medium is extremely complex: diffraction, dispersion, apparent attenuation, ... An interesting feature for engineering applications is the transfer of energy from an initially coherent pulse into incoherent signal (the coda). Indeed, waves hitting a structure in a disordered manner are usually less dangerous than a coherent pulse with the same energy. Another physical phenomenon with strong potential for applications is the Anderson localization. Very well known for the Schrödinger equation, its use in engineering with classical waves has been less studied. This talk will explore these phenomena in the context of railway engineering, and in particular for solid waves going through the ballast layer onto the surroundings of the tracks. A continuum-based randomly-fluctuating elastic medium model will be described for ballasted railway tracks. The accounting of the inherent heterogeneity of this granular medium will be shown to be essential to reproduce certain experimental observations previously unexplained.



L. de Abreu Corrêa, J. C. Quezada, R. Cottureau, S. Costa d'Aguiar and C. Voivret. Randomly-fluctuating heterogeneous continuum model of a ballasted railway track. *Computational Mechanics*, 60(5), pp. 845-861, 2017.

L. de Abreu Corrêa, R. Cottureau and B. Faure. Dispersion analysis in ballasted railway tracks and Anderson localization in granular media. *Journal of Sound and Vibration*, 465(115010), pp. 1-13, 2020.