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RAILWAY AND ROAD NOISE AND VIBRATIONS - MODELING OF PROPAGATION AND MITIGATION

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ABSTRACT

In the last decades, the increase of railway and road traffics has led to theoretical and applied research on the prediction of induced noise and vibrations, its propagation in fluid and elastic media and definition of mitigation strategies. In these complex fields, the role of numerical approaches is well-known and its development and application have been expanding as can be seen by the increasing number of researchers and published works on related themes. When derived and used adequately, numerical techniques enable the achievement of accurate solutions to application problems and to address larger problems in due time.

The topics of interest to the proposed Minisymposium include (nonexclusively) the development of numerical methods to forecast noise levels and vibration amplitudes; the application of different numerical techniques, such as FEM, BEM, FD or meshless methodologies (among others, MFS, RBF collocation method, MLPG, PIM), to fluid and/or elastic wave propagation problems; the joint use of different mathematical formulations and numerical methods, in order to maximize individual advantages of each technique; the prediction of soil vibrations produced by train and road traffics, and dynamic effects on structures situated near the track and the road; the improvement and development of numerical and semi-analytical techniques for the modelling of three-dimensional wave propagation in solid and/or fluid layered media induced by fixed and moving loads.

In the proposed Minisymposium, academic researchers as well as engineering specialists are invited to present recent theoretical developments on numerical methods and interesting/challenging application problems regarding the propagation of noise and vibrations induced by railway and road traffic. The use of recent numerical techniques is also encouraged focusing on the modelling of mitigation strategies devised to reduce significant impacts caused by those important infrastructures.

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