Numerical model for transmission of vibration from distant source

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ABSTRACT

The proximity of industrial areas, source of vibrations transmitted through the ground, and residential areas, generate discomfort in the building occupants and possible damage to nonstructural elements of buildings. A similar situation occurs in the musical or sporting events performing in stadiums.

In order to predict the structures vibrations, a commercial software [1] performance is analyzed to fully represent these events, including the dynamic model of the excitation source, the pattern of transmission of vibrations through the ground and the dynamic model of the structure, with the interactions between them.

Continuing an earlier published [2], in this paper the numerical solution and the analytical solution for the transmission of waves in a semi-infinite medium are compared. To discretize a finite domain, infinite domains are incorporated into the contours to minimize reflection.

Examples with different degrees of refinement in the finite element mesh and different position of infinite domains that define the sector analysis are performed. Useful conclusions are obtained to address problems of full scale.

REFERENCES

[1] COMSOL Multiphysics Reference Manual, version 4.3, Comsol, 2012.
[2] Möller, O., Ascheri, J.P., Poliotti, M. "Predicción numérica de vibraciones en estructuras producidas por fuentes distantes", *Mecánica Computacional*, XXXIII, 1585-1600 (2014)