Perfectly Matched Layer (PML) for Transient Wave Propagation in a Moving Frame of Reference - DTU Orbit (28/12/2018)

Perfectly Matched Layer (PML) for Transient Wave Propagation in a Moving Frame of Reference
In relation to the development of a Rolling Wheel Deflectometer (RWD), which is a non-destructive testing device for measuring pavement deflections, a finite element model for obtaining the soil/pavement response is developed. Absorbing boundary conditions are necessary in order to prevent reflections of the waves propagating through the soil due to the dynamic loading. The Perfectly Matched Layer (PML) has proven to be highly efficient when solving transient wave propagation problems in a fixed mesh. However, since the RWD is operating at traffic speeds, the load is moving with high speed and a formulation in a moving mesh is therefore more convenient. In this paper, a formulation of the PML is developed in the moving frame of reference. Numerical results are presented for a single layer and a double layer half space, respectively, subjected to a moving load of different velocities.

General information
State: Published
Organisations: Department of Civil Engineering, Section for Geotechnics and Geology, Department of Mechanical Engineering, Solid Mechanics
Contributors: Madsen, S. S., Krenk, S., Hededal, O.
Number of pages: 10
Publication date: 2013

Host publication information
Title of host publication: Proceedings of the 4th ECCOMAS Thematic Conference on Computational Methods in Structural Dynamics and Earthquake Engineering
Keywords: Absorbing boundaries, PML, Finite element, Moving load, Wave propagation
Electronic versions:
Perfectly Matched Layer (PML) for Transient Wave Propagation in a Moving Frame of Reference.pdf
URLs:
http://eccomasproceedings.org/cs2013/
Source: dtu
Source-ID: u::10442
Research output: Research - peer-review › Article in proceedings – Annual report year: 2014