

Nu m e r i c a l M o d e l l i n g o f R a d i a t i n g B o u n d a r y C o n d i t i o n s f o r W a v e P r o p a g a t i o n i n N o n l i n e a r M e d i a

by

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in

*USMCA-20178:17th International Symposium on New Technologies for Urban safety of Megacities in Asia
(USMCA 2018)*

Report No: IIIT/TR/2018/-1



Centre for Earthquake Engineering
International Institute of Information Technology
Hyderabad - 500 032, INDIA
December 2018

Numerical Modelling of Radiating Boundary Conditions for Wave Propagation in Nonlinear Media

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ABSTRACT

The effect of boundary conditions on the numerical simulations is one of the important aspect for the truncated soil domain in soil structure interaction problems. In fact, soil is a nonlinear medium and modelling the boundary conditions has to consider the nonlinear behaviour to resemble the wave propagation in nonlinear media. In this study, Local Absorbing Boundary Conditions for the wave propagation in nonlinear media (NLABC) are presented.

The efficiency of the proposed methods has been verified for both 1D and 2D wave propagation problems using explicit solver and the accuracy is compared with extended meshed models. The study concluded that better responses can be obtained by using the proposed approach when compared with traditional Local Absorbing Boundary Conditions. It is also inferred that the proposed method inherently considered the relaxation due to plastic deformation beyond the numerical domain boundary.

Keywords: Absorbing Boundary Conditions, Soil-Structure Interaction, Wave Propagation velocities, Nonlinear material
