

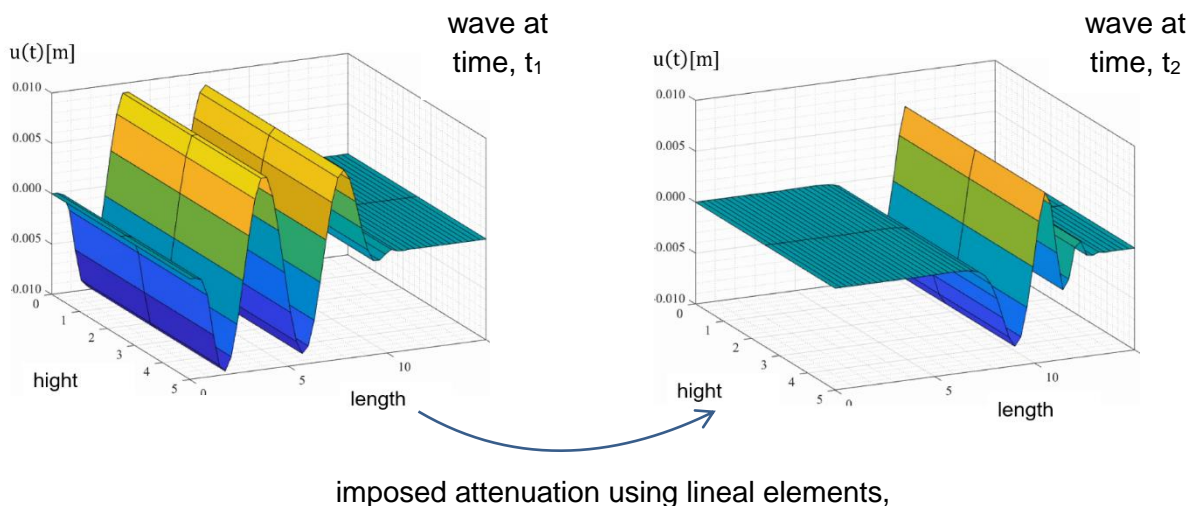
Bachelor Thesis

Inhomogeneous 1D-wave representation using IGA and PML

Background

The wave modeling in unbounded domains is a relevant procedure in civil engineering applications for transient analysis. Independent of the kind of excitation, and dynamic and material properties in the computational medium, the wave modeling must be accurate and satisfy the radiation condition at the infinity. The last condition is commonly a huge concern, which is solved in different ways depending on the treated problem and available resources.

Here, a numerical approach is proposed based on the isogeometric analysis, IGA, and the perfectly Matched Layer method, PML, to accomplish such demands. The IGA is an innovative method capable to approach more accurately the problem using high-order basis functions. The PML attenuates the wave by using an artificial layer.



Aim

The main task is to implement, in MATLAB ©, a heterogeneous material using IGA and PML for the modelling of the scalar wave. Additionally, after a validation, a parameter study will be done in order to depict the effects of the used methodology.

Contact