Chair of Computational Modeling and Simulation
TUM Department of Civil, Geo and Environmental Engineering
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Modeling:
Mathematics:
Programming:
Science:

Software Lab:

Identification and Visualization of Seismic Wave in 3D Soils

Description

During seismic events, different waves propagate through the soil and their combination create a complex vibration pattern. Identifying and discriminating the various types of seismic waves is important for the safe design of buildings, infrastructures and vibration reduction measures. This task can be facilitated using visual tools, which greatly enhance the understanding of complex phenomena.
For a linear elastic continuum, the problem is described using the Lamé equation and different wave types can be isolated mathematically [1]. The aim of the project is to translate the mathematical expressions of the different seismic waves into visual objects and to create an interactive algorithm to analyse the wave types.

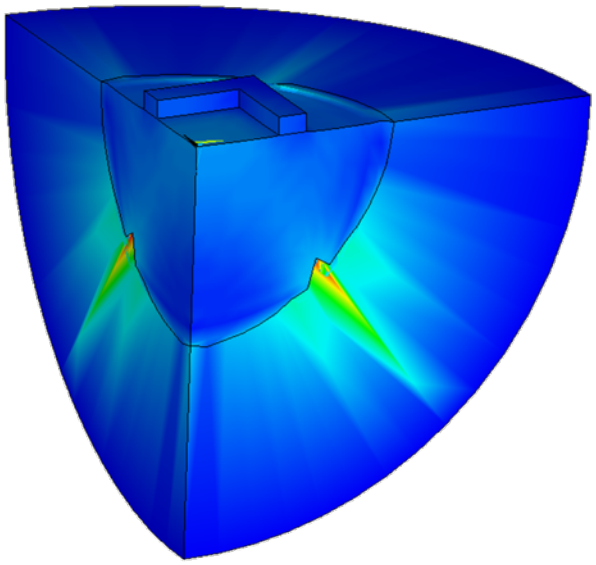

Figure 1: Cut of a 3D soil-foundation model: Propagation of waves from an oscillating foundation strip.

Task

Implement an interactive algorithm for the identification and visalization of seismic waves in three-dimensional soils.

- Get familiar with the Lamé equation and its solution (in form of a Matlab code)
- Extend an existing code to identify and isolate the different wave types in GiD [2]
- Create a visualization concept, that allows a better understanding of the phenomenon

Supervisor

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References

[1] Lecture notes of the course: “Soil vibrations”
[2] https://www.gidhome.com/whats-gid/