SCHOOL OF COMPUTATION, INFORMATION AND TECHNOLOGY — COMPUTATIONAL SCIENCE AND ENGINEERING

TECHNISCHE UNIVERSITÄT MÜNCHEN

Master's Thesis in Computational Science and Engineering

Wave Reversal in SeisSol using the Instantaneous Time Mirror

Vikas Kurapati

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I confirm that this master's thesis is my own work and I have documented all sources and material used.

Garching bei München, March 16, 2023 Vikas Kurapati

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Abstract

This thesis presents a numerical investigation of the wave reversal technique using the Instantaneous Time Mirror method in the simulation software SeiSSol (https://seissol.org/). The focus of the study is to develop a novel approach to accurately determine the source of an earthquake by analyzing the time evolution of the waves in both the forward and time-reversed directions..Finally, the method was applied to the benchmark test, demonstrating the ability of the technique to retrace the source of a Seissmic wave.

Contents

1 Introduction

1.1 Section

Citation test [Lam94].

Acronyms must be added in `main.tex` and are referenced using macros. The first occurrence is automatically replaced with the long version of the acronym, while all subsequent usages use the abbreviation.

E.g. `\ac{TUM}, \ac{TUM}` ⇒ Technical University of Munich (TUM), TUM

For more details, see the documentation of the `acronym` package[1].

1.1.1 Subsection

See Table 1.1, Figure 1.1, Figure 1.2, Figure 1.3.

Table 1.1: An example for a simple table.

A	B	C	D
1	2	1	2
2	3	2	3

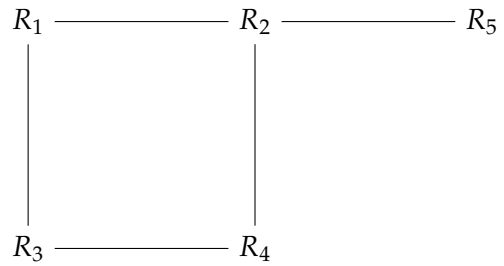

Figure 1.1: An example for a simple drawing.

[1] `https://ctan.org/pkg/acronym`

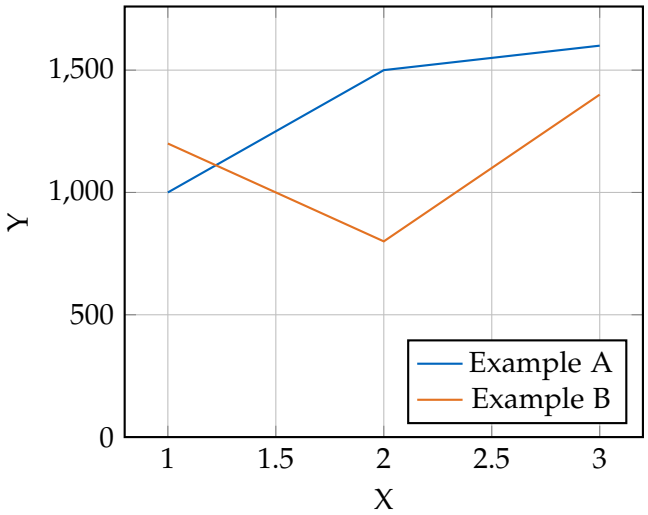

Figure 1.2: An example for a simple plot.

```
SELECT * FROM tbl WHERE tbl.str = "str"
```

Figure 1.3: An example for a source code listing.

Abbreviations

TUM Technical University of Munich

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Bibliography

[Lam94] L. Lamport. *LaTeX : A Documentation Preparation System User's Guide and Reference Manual*. Addison-Wesley Professional, 1994.