Annual Report for SCEC Project 23206

An Interactive Database of Dynamic Earthquake Rupture Publications and their Assumptions ("Ingredients") for Use in Expanding the Knowledge of Current and Next Generation Scientists

Submitted to SCEC by PI Ruth Harris
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Motivation:

For five decades scientists have been using computational simulations of dynamic (spontaneous) earthquake rupture to better understand earthquake sources, especially for large earthquakes. Long ago there were some peer-reviewed publications on the topic, but in recent times, there is a plethora of journal articles. This means that we may easily forget or never have read the good work done in the past, and we are also likely to be unaware of many of the numerous publications being produced in the present. To this end, I decided that we should put together a database of information about the peer-reviewed dynamic rupture papers published in high-quality journals over the years. The goal was to not only list the publications themselves, but to also provide detailed information about the "ingredients" or assumptions used to conduct the simulations in each paper, along with the authors' proposed applications for each study.

The Work:

From December 2023 to March 2024 I l have led an activity whereby many members of our dynamic rupture group thoughtfully provided information about their peer-reviewed journal publications. There were bounds on what content these publications needed to contain, and restrictions on the types of publications which could be included. Even with these requirements, much information has been provided. The resulting compilation is envisioned as a living document with updates to the information anticipated in the future. The updates will include new publications as they are produced, as well as information about more papers from the past.

Content Overview:

*The publications included in our compilation involve dynamic (spontaneous) rupture simulations.
*The simulations were conducted in 2D or 3D (1D was insufficient)
*The publications could primarily involve simulations of earthquake cycles, if the coseismic portions of the simulations were fully dynamic (spontaneous rupture).

Types of Publications:

*The publications are peer-reviewed journal articles (preprints are not allowed).
*The papers are published in English.
*The papers are published in a pre-specified list of well-regarded peer-reviewed journals, although decisions about which journals are "well-regarded" is open to negotiation.
*Although excellent work has been published in book chapters and other similar products, these types of publications are not included due to potential differences in their peer-review processes and the sometimes unknown availability of the publications themselves.

Our results are a compilation delivered as an excel spreadsheet. The spreadsheet is posted on our SCEC website, strike.scec.org/cvws. The compilation includes information about publications from 29 of us who are dynamic rupture modelers. These publications are listed by date, then in order of my receiving the information from our group members.

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