Overview of the SEAS platform

https://strike.scec.org/cvws/cgi-bin/seas.cgi

The SCEC Sequences of Earthquakes and Aseismic Slip Project

Benchmark Comparison Tool

Benchmark Descriptions

Downloads

Workshop Presentations

Benchmark Descriptions

Click on the benchmark name for a detailed description and instructions to modelers.

BP1-QD	(Formerly BP1) 2D antiplane shear motion. The fault is a vertical strike-slip fault in a homogeneous halfspace. Friction is regularized rate-and-state friction with an aging law.
BP2-QD	(Formerly BP2) 2D antiplane shear motion. The fault is a vertical strike-slip fault in a homogeneous halfspace. Friction is regularized rate-and-state friction with an aging law. This benchmark explores the effects of varying the cell size.
BP1-FD	(Formerly BP3) 2D antiplane shear motion, with full elastodynamics. The fault is a vertical strike-slip fault in a homogeneous halfspace. Friction is regularized rate-and-state friction with an aging law.
BP4-QD	(Formerly BP4) (Updated 12/23/2019) 3D motion in a wholespace. The fault is a vertical strike-slip fault in a homogeneous wholespace. Friction is regularized rate-and-state friction with an aging law and radiation damping.
BP3-QD	2D plane-strain motion, quasidynamic. The fault is a dipping normal fault in a homogeneous linear elastic halfspace. Friction is regularized rate-and-state friction with an aging law and radiation damping.
BP5-QD	3D motion in a halfspace, quasidynamic. The fault is a vertical strike-slip fault in a homogeneous linear elastic halfspace. Friction is regularized rate-and-state friction with an aging law and radiation damping.

Note: "BP1" stands for "Benchmark Problem 1."

Back to the SEAS Project Home Page.

This page was last updated or reviewed on 26 September 2020.

For login/account information email Brittany (bae@uoregon.edu) or Junle (jiang@ou.edu)

Overview of the SEAS platform

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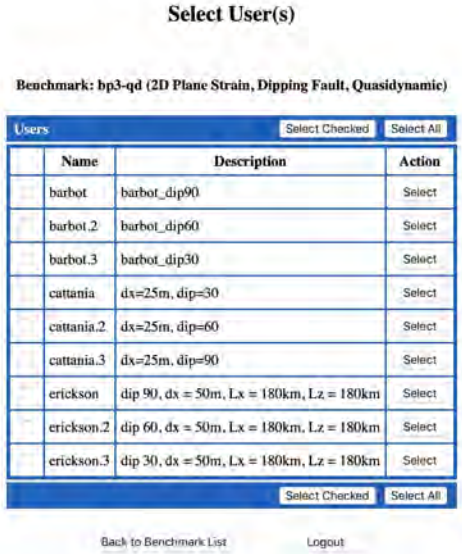

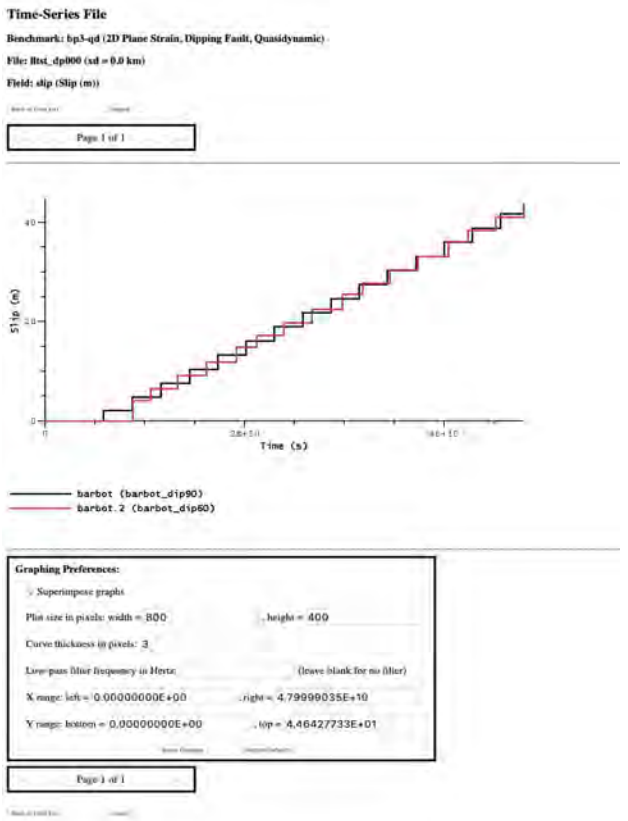

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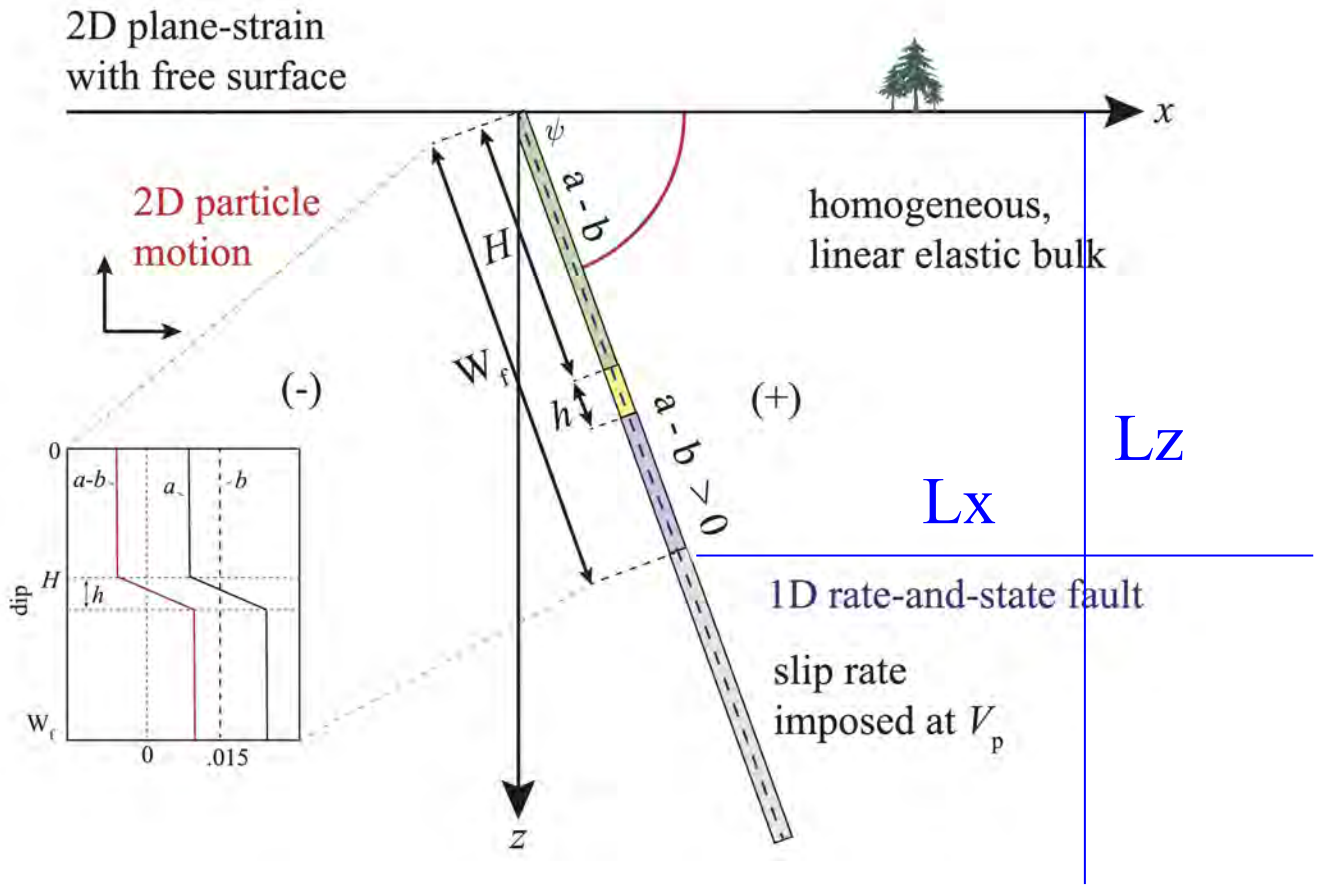
Session 2: Benchmark BP3-QD

- Overview of the problem
- Participating codes
- Slip profile comparisons
- Time series comparisons
- Discussion

BP3-QD:

Suggested **cell size**: 25m
Dip angles: 30, 60, 90 degrees



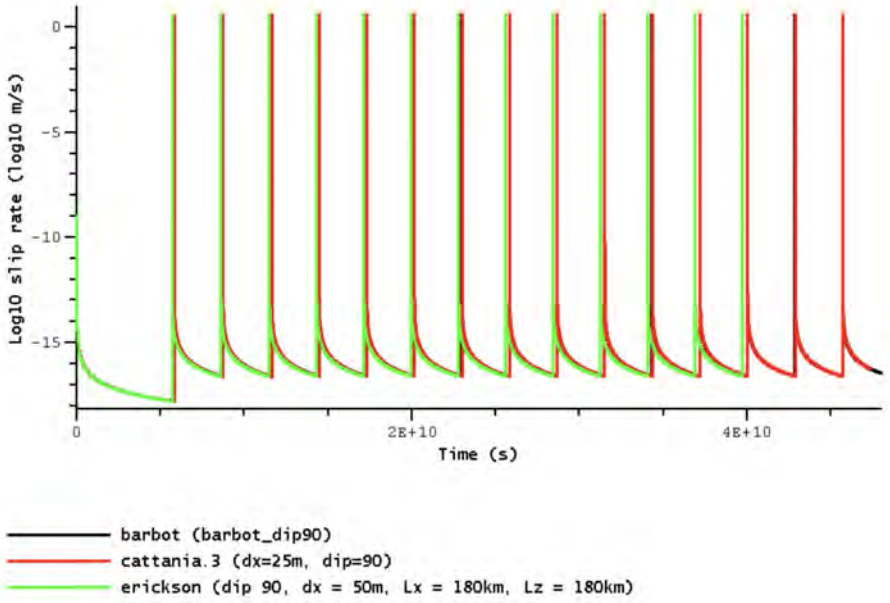
Thanks: Eric and Sylvain for help writing this benchmark problem.

BP3-QD: Overview of participating codes

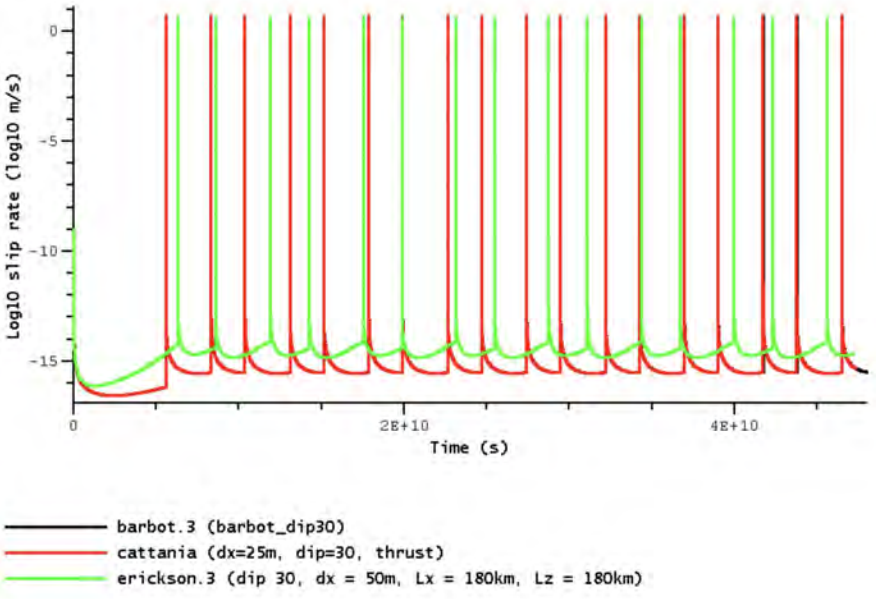
- [modeler barbot]: Unicycle, BEM
- [modeler cattania]: FDRA, BEM
- [modeler erickson]: FDCycle, Finite Diff.

BP3-QD: Overview of on-fault time-series comparisons

Dip 90 degrees



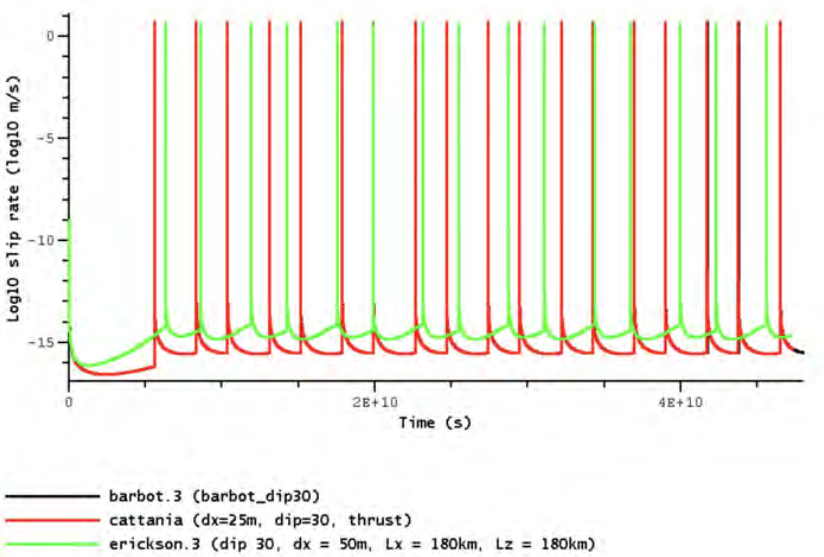
Dip 30 degrees



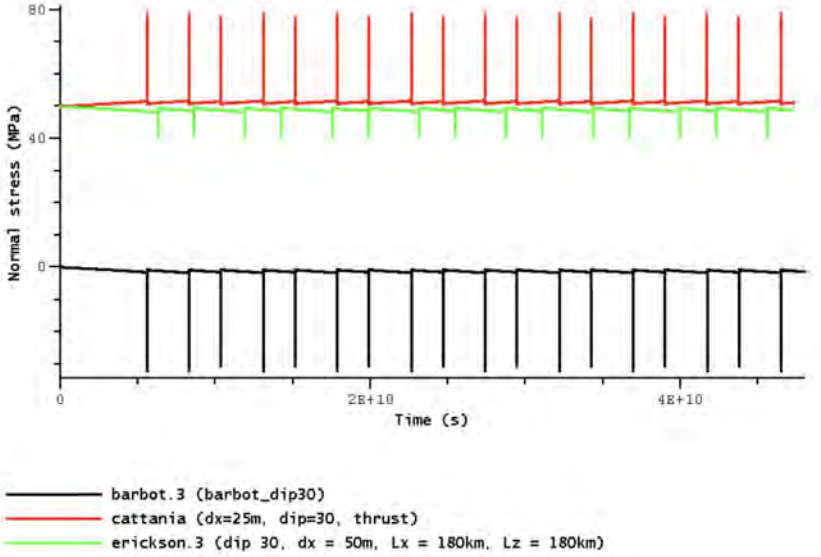
Results with dip 90 degrees match well across groups, don't with dip 30 degrees. Why?

BP3-QD: Overview of on-fault time-series comparisons

Dip 30 degrees

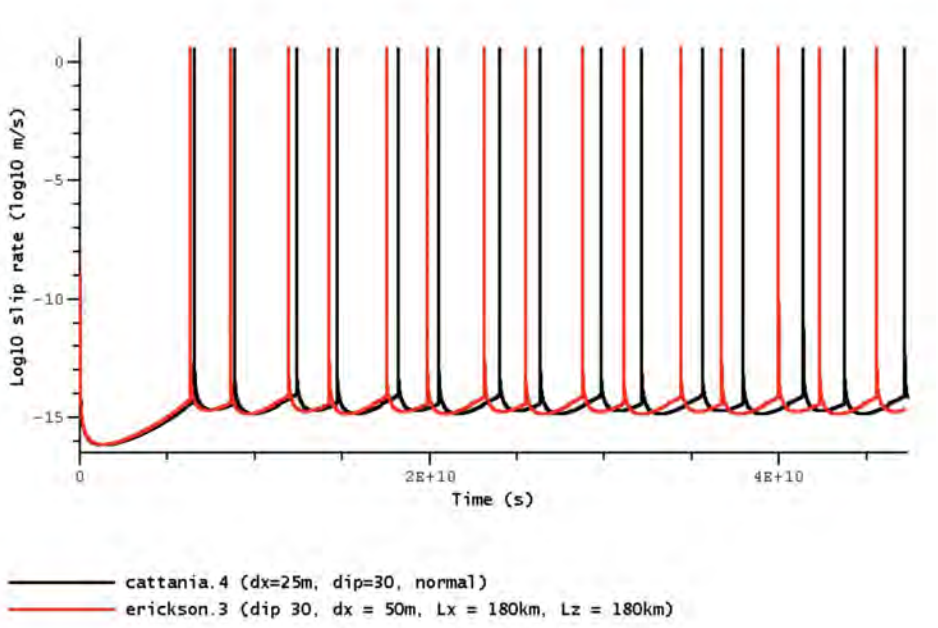


Dip 30 degrees



Surface slip rate (left) and normal stress (right): sign discrepancies?

BP3-QD: Overview of on-fault time-series comparisons



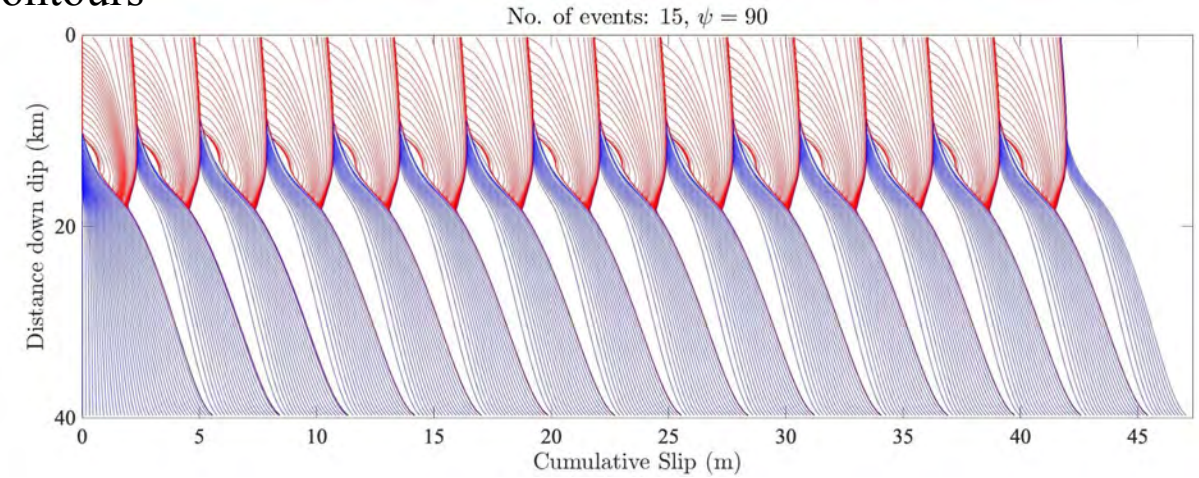
Results differ if thrust or normal faulting is assumed (this is not specified in problem description!)

Discrepancies still exist...

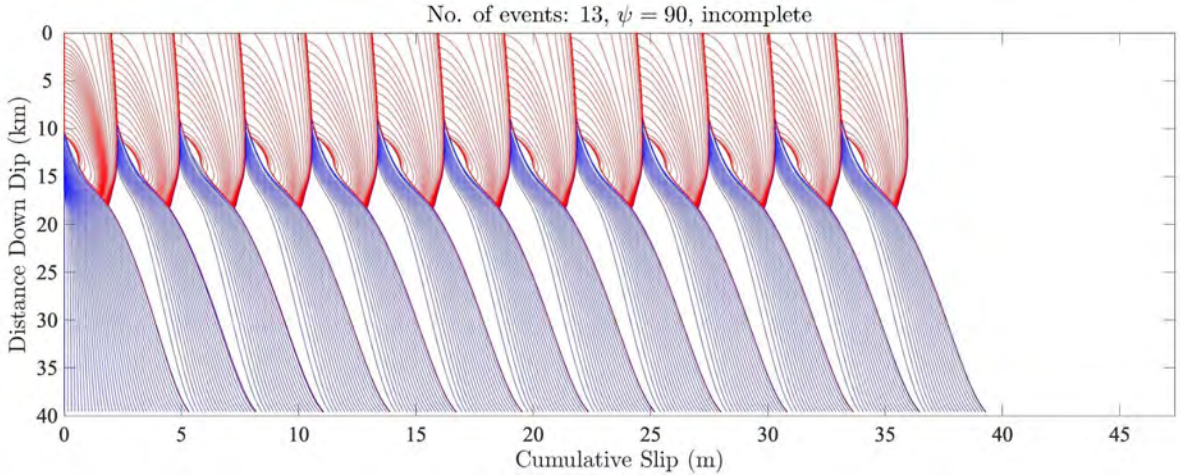
Dip 30 degrees: is the sense of slip normal or thrust?

BP3-QD: slip contours

cattania



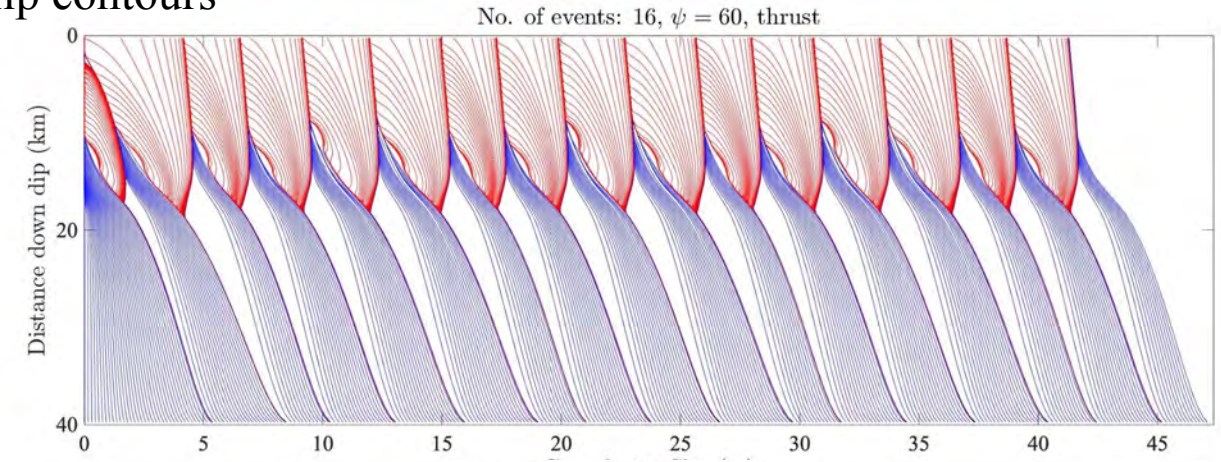
erickson



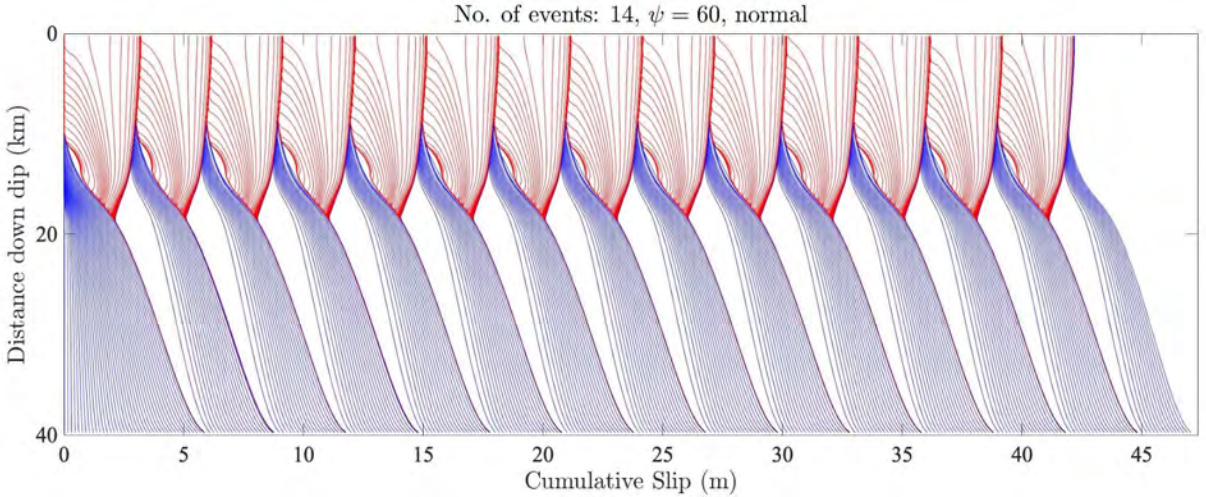
Results agree reasonably well in terms of nucleation depth, total slip.

BP3-QD: slip contours

cattania (thrust)

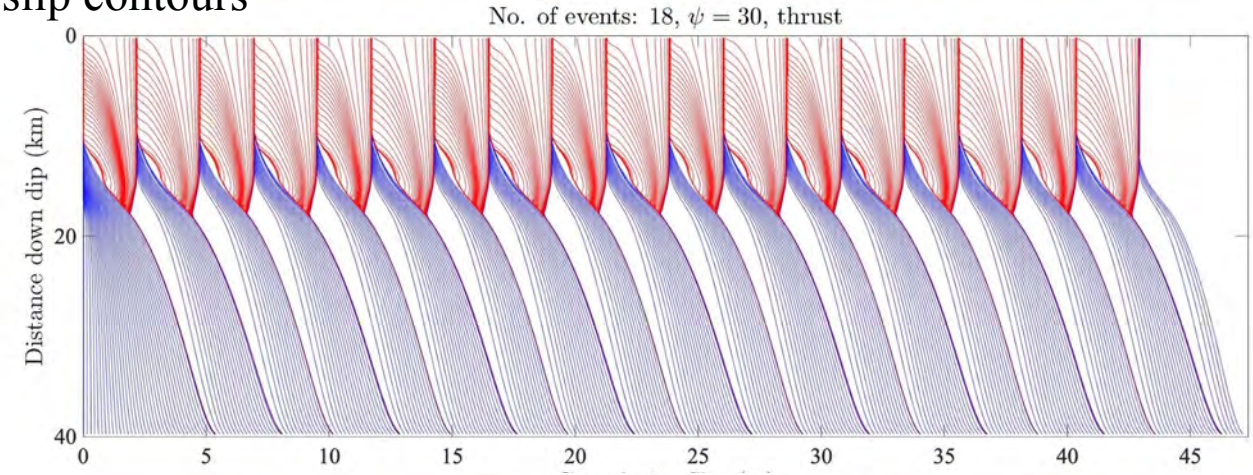


cattania (normal)

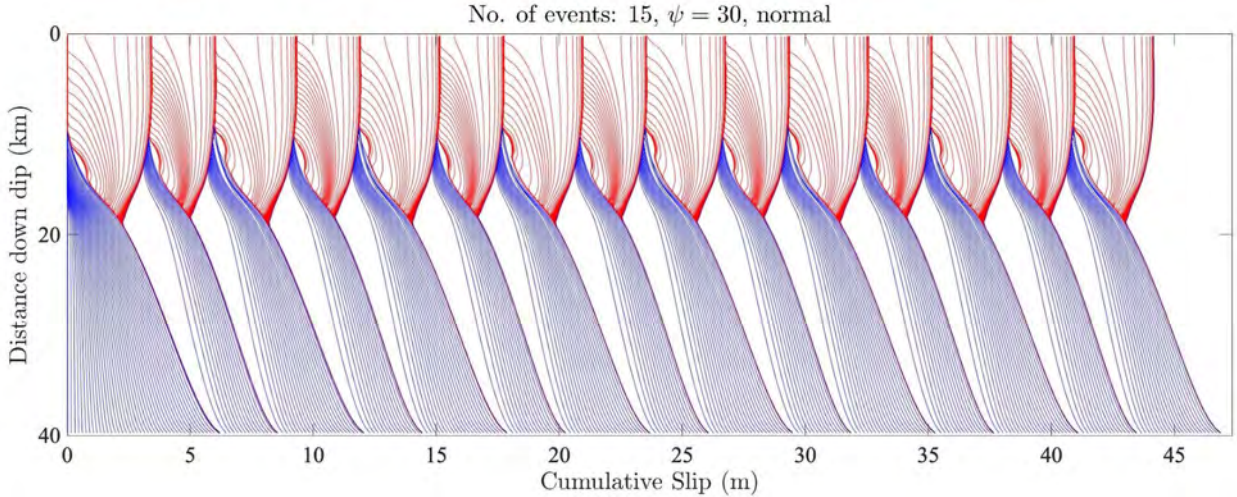


BP3-QD: slip contours

cattania (thrust)



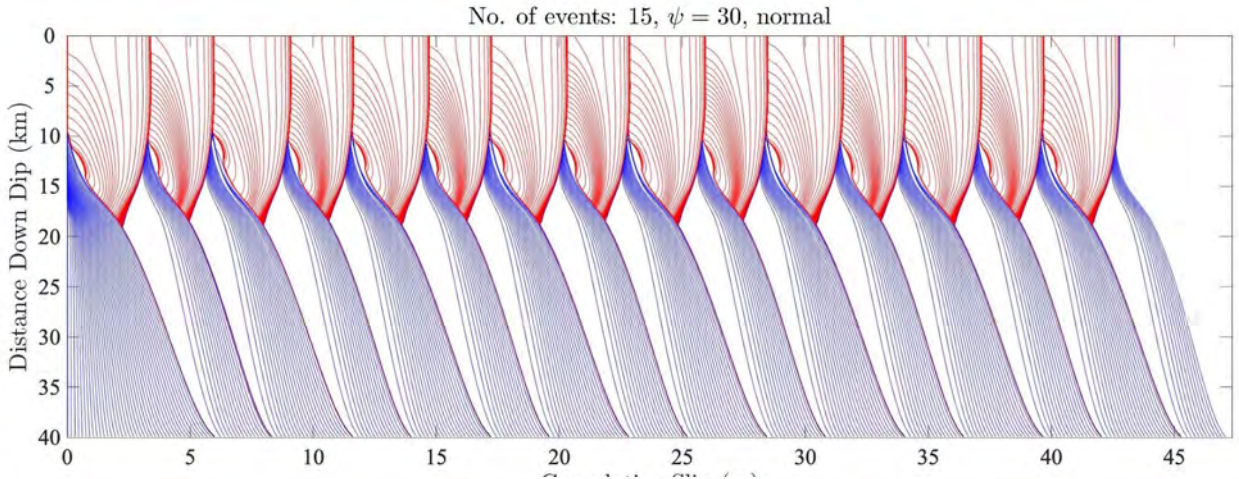
cattania (normal)



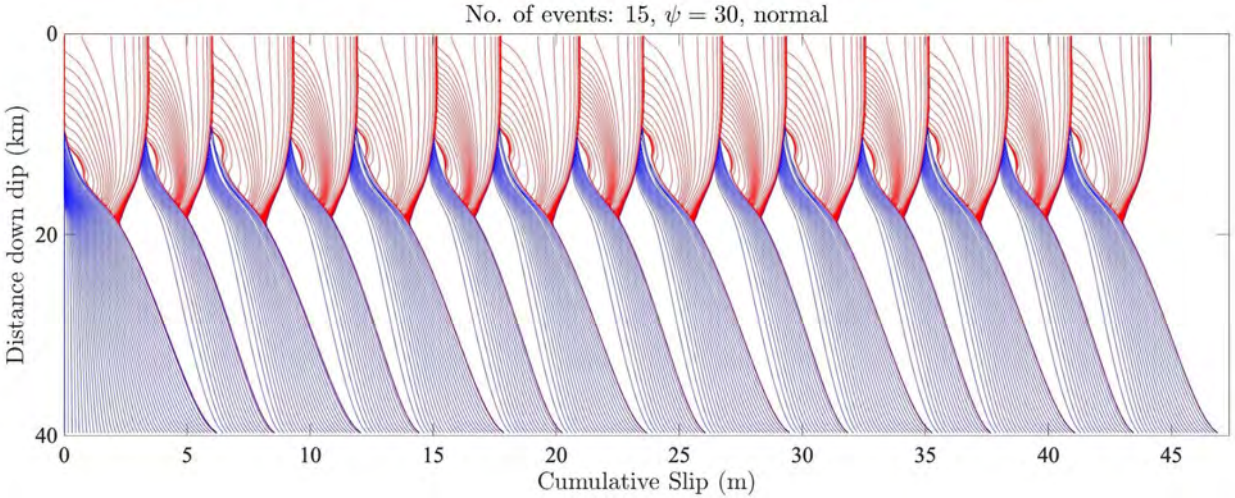
Camilla: Thrust faulting (increase in normal stress) decreases h* leads to more events with less slip.

BP3-QD: slip

erickson



cattania



BP3-QD (To Do)

- specify thrust or normal faulting (or ask for both) in benchmark problem description.
- confirm sign conventions and check for errors.
- compare time series at off-fault surface stations (currently only have barbot results).
- for volume based codes explore dependency on computational domain size, cell size (need to get down to 25m).