Community Stress Model Workshop: Day 1

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Comparison of Models

- Better agreement among models in central portion
- Most models limited to stress orientation
- Bird SHELLS only model with significant amplitude depth dependence
- Infrastructure
  - Compare/merge models
  - Smoothing/interpolation filter
  - L1 norm for differences

Model Branches

- Data
  - Focal mechanisms
  - World Stress Map
  - Crustal splitting
  - Well/borehole logs
- Physics-based stress
- Physics-based stress rate

Validation

- Geodetic based models
  - Strain/stres rate from Community Geodetic Model
  - Strain/stress rate from UCERF3 deformation models
- Geology
  - Dike azimuth
  - Grain size evaluation
  - Slickensides
- Rake angles from resolving stress on CFM surfaces
- Focal mechanisms
- Special study site (e.g., Coso, Brawley)

Uncertainty and Heterogeneity

- Quantifying uncertainty
  - Straightforward and relatively easy for focal mechanism-base models
  - Monte Carlo approach (much more work) for physics-based models
  - Need uncertainties in Community Fault Model geometry
- Stochastic heterogeneity
  - Important for many applications (e.g., spontaneous rupture modeling)
  - Stress is likely scale invariant
  - May change with distance from faults
  - May depend on maturity of faults

Miscellaneous

- World Stress Map
  - Need to coordinate with WSM developers
  - Contribute information to WSM to improve resolution in southern CA
- Questions for John Shaw
  - What well log & borehole industry data is available?
    - Geographic coverage?
    - Density of coverage?
  - Other data to constrain Community Stress Model?

Day 2: Moving Forward

Revisit topics discussed in Day 1 and discuss how to move forward

- Discussion 1
  - Reconciling model branches
  - Validation
- Discussion 2
  - Uncertainty
  - Heterogeneity
- Discussion 3
  - Model format
  - IT infrastructure
- Wrap-up Discusion
  - What is the SCEC Community Stress Model?
  - Targeting important issues with SCEC proposals