Workshop on ‘Nonlinear’ Shallow Crust Effects

SATURDAY, SEPTEMBER 9, 2017

09:00 - 09:05 Welcome, agenda, objectives
09:05 - 09:15 Overview of SCEC’s modeling and simulation software family
09:15 - 09:30 Current leading efforts in SCEC’s 3D regional simulations including plasticity and small scale heterogeneities
09:30 - 09:40 The long-run computational challenges for using 3D simulations in seismic hazard analysis
09:40 - 09:55 Datasets and data analysis for geotechnical site (profiles) characterization
09:55 - 10:10 SVM – A stochastic velocity model of the shallow crust based on geotechnical site characterization data
10:10 - 10:20 Break
10:20 - 10:30 Short catch-up Q&A and discussion
10:30 - 10:45 Characterization of the Earth’s shallow crust
10:45 - 11:00 Physical properties of damaged rock zones as inferred from observations
11:00 - 11:15 Soil mechanics, constitutive models used in 1D/2D/3D geotechnical modeling
11:15 - 11:30 Simple soil constitutive models for wave propagation problems and their potential integration in 3D simulations
11:30 - 12:00 Discussion
12:00 - 13:00 Lunch
13:00 - 13:05 Re-cap and afternoon plan
13:05 - 13:15 Short catch-up Q&A and discussion
13:15 - 13:30 2D nonlinear and topography effects at local scales
13:30 - 13:45 2D nonlinear and 3D topography effects at regional scales
13:45 - 14:00 Other efforts in regional EQ simulation outside
14:00 - 14:20 Implications for SCEC modeling tools
14:20 - 14:40 Implications for SCEC special projects
14:40 - 14:50 Break
14:50 - 15:50 Open Q&A and discussion about topics covered and other relevant, related issues
15:50 - 16:50 Open discussion about plans for a TAG and suggestions of language to be included in the RFP
16:50 - 17:00 Closing remarks
‘Nonlinear’ effects and shallow crust**
(previously known as GTL)

- Shallow crustal velocity and inelastic attenuation
- Spatial variability and scattering effects
- Nonlinear rheology and parameter space for sediments
- Topography effects...

... and any other effects that alter the amplitude, frequency, duration and direction of wavefield when it reaches the shallow crust**
  (e.g. topography and layering are coupled, even for elastic media)

**In SCEC5, the geotechnical layer (GTL) becomes shallow crust, i.e. soils, their subsurface geometry and topography are considered path
What do we want to achieve today:

• Overview of the state-of-the-art

• Develop a roadmap of research milestones to integrate nonlinear effects in SCEC5 3D physics-based simulations

• Reach consensus on Technical Activity Group (TAG) charged to coordinate and support our collaborative research.