International Workshop on
Ground Motion Simulation Validation

SCEC Award # 16162

Conveners:
Sanaz Rezaeian and Nico Luco (USGS)
Brendon Bradley (QuakeCoRE, NZ)
Iunio Iervolino (ReLUIIS, Italy)
Leonardo Ramirez-Guzman (Mexico City)

SCEC Annual Meeting, 11 September 2016, Palm Springs, CA
# Agenda

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<td>13:00-13:05</td>
<td>Introductions</td>
<td>S. Rezaeian</td>
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<td>13:05-13:15</td>
<td>The SCEC perspective on validations in SCEC5</td>
<td>C. Goulet</td>
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<td>13:15-13:25</td>
<td><strong>Overview of GMSV Efforts in New Zealand, Italy, Mexico, and at SCEC</strong></td>
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<td>13:25-13:40</td>
<td>QuakeCoRE GMSV research coordination and current priorities</td>
<td>B. Bradley</td>
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<td>13:40-13:55</td>
<td>Italian experience with 3D physics-based numerical simulations of earthquake ground motion</td>
<td>M. Stupazzini</td>
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<td>13:55-14:05</td>
<td>Synthetic ground motion system for structural design and evaluation in Mexico City</td>
<td>L. Ramirez-Guzman</td>
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<td>13:55-14:05</td>
<td>Organization and structure of the GMSV TAG in SCEC4</td>
<td>N. Luco</td>
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<td>14:05-14:30</td>
<td><strong>Discussion:</strong> How should modelers and engineers participate in and contribute to the SCEC5 ground motion simulation validation efforts?</td>
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<td>14:30-14:40</td>
<td><strong>Simulated Earthquake Ground Motions and Database Development</strong></td>
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<td>14:30-14:40</td>
<td>Development of a QuakeCoRE database for access to ground motion simulation outputs at specific locations</td>
<td>S. Bae</td>
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<td>14:40-14:50</td>
<td>Datasets of recorded and simulated near-source earthquake ground motions: the experience gained in Italy</td>
<td>M. Stupazzini</td>
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<td>14:50-15:00</td>
<td>Current SCEC simulations</td>
<td>P. Maechling</td>
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<td>15:00-15:25</td>
<td><strong>Discussion:</strong> What are the requirements of a database interface for users to access simulated ground motions and validation parameters?</td>
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<td>15:25-15:40</td>
<td>Break</td>
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<td>15:40-15:50</td>
<td><strong>Validation Efforts and Engagement with Engineering Users</strong></td>
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<td>15:40-15:50</td>
<td>QuakeCoRE guidance on the utilization of ground motion simulations in engineering practice</td>
<td>B. Bradley / J. Baker</td>
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<td>15:50-16:00</td>
<td>Engineering applications of 3D physics-based numerical simulations: two case studies from the Reluis project, Italy</td>
<td>M. Stupazzini</td>
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<td>16:00-16:15</td>
<td>Demonstration of the efficacy of the BBP validation gauntlets for building response analysis applications</td>
<td>N. Luco / G. Deierlein</td>
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<td>16:15-16:45</td>
<td><strong>Discussion:</strong> How should we engage engineering users in SCEC5?</td>
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<td>16:45-17:00</td>
<td><strong>Summary and Wrap Up</strong></td>
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<td>17:00</td>
<td>Adjourn</td>
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Organization and structure of the GMSV TAG in SCEC5:

How should modelers and engineers participate in and contribute to the SCEC5 ground motion simulation validation efforts?

Continue coordinating independent project? Or “bigger group” proposals”?

Anything else we should discuss that hasn’t been talked about?
Simulated ground motion database:

What are the requirements of a database interface for users to access simulated ground motions and validation parameters?

Anything else we should discuss that hasn’t been talked about?
Validation needs and engagement with users:

*How should we engage engineering users in SCEC5?*

*Validation beyond median gm? variability and spatial correlation?*

*Anything else we should discuss that hasn’t been talked about?*
1. Organization and Structure of the TAG

Goulet: SCEC perspective
- transparent validations and forward simulations
- ongoing collaboration w/ users
- integrating tools on the platform

Bradley: QuakeCoRE
- use of simulation in engineering design
- also looking at uncertainty
- validation for historical recordings, starting to look at forward simulations

Stupazzini: ReLIUS
- importance of 3D numerical modeling
- validation vs. historical recordings and a GMPE

Ramirez-Guzman: Mexico City
- importance of site effects
- synthetic “system” for use by engineers, given (M, site, hyp)
- … validation components in progress

Luco: SCEC4 GMSV TAG
1. Organization and Structure of the TAG

Luco:
- objective: “testing/rating methodologies, via collaboration with gm modelers and engineering users…."
- no consensus on validation methods → many projects
- multi-PI projects

2. Database Interface

Bae:
- QuakeCoRE database interface
- Public awareness and communicating with engineers

Stuppazini:
- ITACA, Italy

Goulet:
- SCEC simulations (“… a little behind on distributing data and siml”)
3. Validation Needs and Engaging Engineering Users

Bradley/Baker:
- Guidance document on utilization of simulations

Stupazzini:
- Eng. Applications of 3D simulations

Deierlein:
- Validation of validation parameters
Discussions:

- Validation vs. historical records & vs. models (GMPEs)
  - Next: vs PSHA targets
- Importance of nonlinearity in simulations
- Validation beyond median, e.g., uncertainty
- Other validation parameters than accel spectra, e.g., displ. and slip
  - for other structures: geotech, tall bldgs., bridges, tanks, etc
- Focus on importance and usefulness of validation parameters, specially for engineering user
  → Focus on specific engineering applications
- Select few simulations appropriate for design (outreach to engineers)

Questions for SCEC5:

- Collaboration vs coordinated projects?
  - Focus on coordination and new validation projects
- External funding, like SEISM?
- Separation of overlapping GMSV-related groups?
  - New groups, e.g., special interest infrastructures?
Coordination Efforts

• Monthly web conference calls
  Thursdays at 11:30am Pacific Time

• Wiki:
  http://collaborate.scec.org/gmsv/