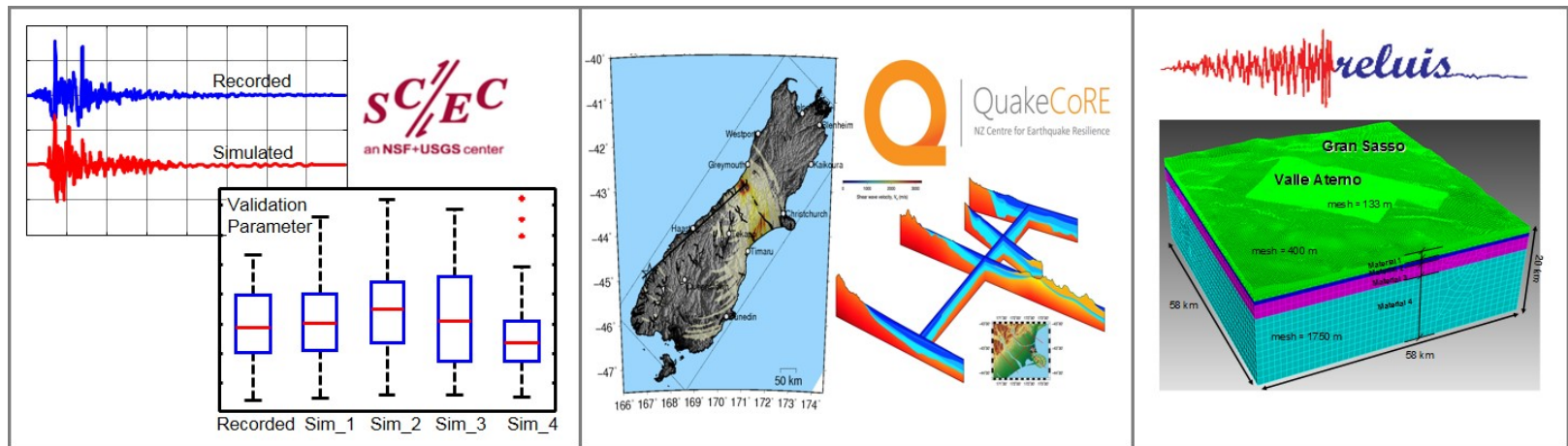


# International Workshop on Ground Motion Simulation Validation



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

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

# Discussion 1

## **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?*

# Discussion 2

## **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?*

# Discussion 3

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## **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?*

# Summary

## 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

# Summary

## 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”)

# Summary

## 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



# Summary

## 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

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- Monthly web conference calls  
Thursdays at 11:30am Pacific Time
- Wiki:  
<http://collaborate.scec.org/gmsv/>