Conveners: Sanaz Rezaeian, Nicolas Luco, Brendon Bradley, Iunio Iervolino, and Leonardo Ramirez Guzman

Workshop Website:

https://www.scec.org/workshops/2016/gmsv

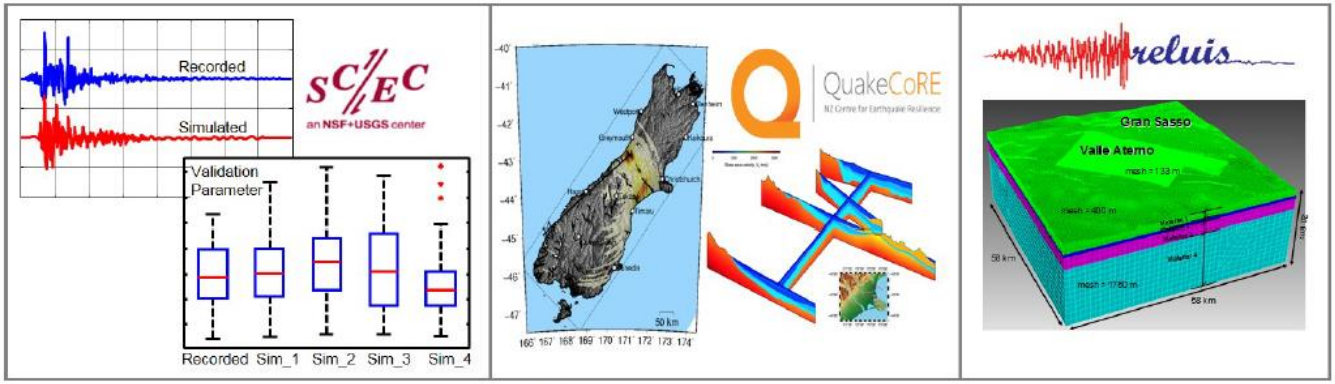
Report:

Established in 2011, the SCEC Ground Motion Simulation Validation (GMSV) Technical Activity Group (TAG) is focused on developing and implementing, via collaboration between ground motion modelers and engineering users, testing/rating methodologies for simulated ground motions that are to be used in engineering applications. In the past year, for example, the GMSV TAG has implemented a gauntlet of validation tests on the SCEC Broadband Platform, a software system that can simulate 0-100 Hz seismograms using several alternative computational methods. Meanwhile, a national network of leading New Zealand Earthquake Resilience Researchers, QuakeCoRE, has begun research there on ground motion simulation and validation, including collaboration with practicing engineers on a document entitled “Guidance on the utilization of earthquake-induced ground motion simulations in engineering practice.” In Italy, a consortium of earthquake engineering laboratories known as ReLUIS has been working on regional simulation of earthquake events and their validation via models of buildings that have suffered damage in corresponding historical events.

In this workshop, we summarized these international GMSV efforts and others (GMSV efforts in Mexico City), further coordinated them, and provided discussions that led to initiation of future collaborations between individual researchers from these groups. The main goal of the workshop was to discuss the future of the GMSV TAG in SCEC5. We encouraged discussions on 1) the organization and structure of the TAG based on lessons learned from other international groups, focused on encouraging interactions between validation researchers, simulation modelers and end users, 2) the need for developing a database interface, where users can access the SCEC simulated earthquake ground motions, and 3) engagement with engineering users and outreach by moving towards an integrated earthquake ground motion simulation and validation program that builds on the knowledge from previous independently-funded GMSV TAG projects. These discussions led to a new proposal for continuation of the GMSV TAG that into SCEC5 with a broadened objective that includes focusing on validations for specific engineering applications as well as validations related to ground motion predictions. The workshop participants are listed below and included ground motion modelers, engineering users, and international delegates alike.

Figure:

International Workshop on
Ground Motion Simulation Validation



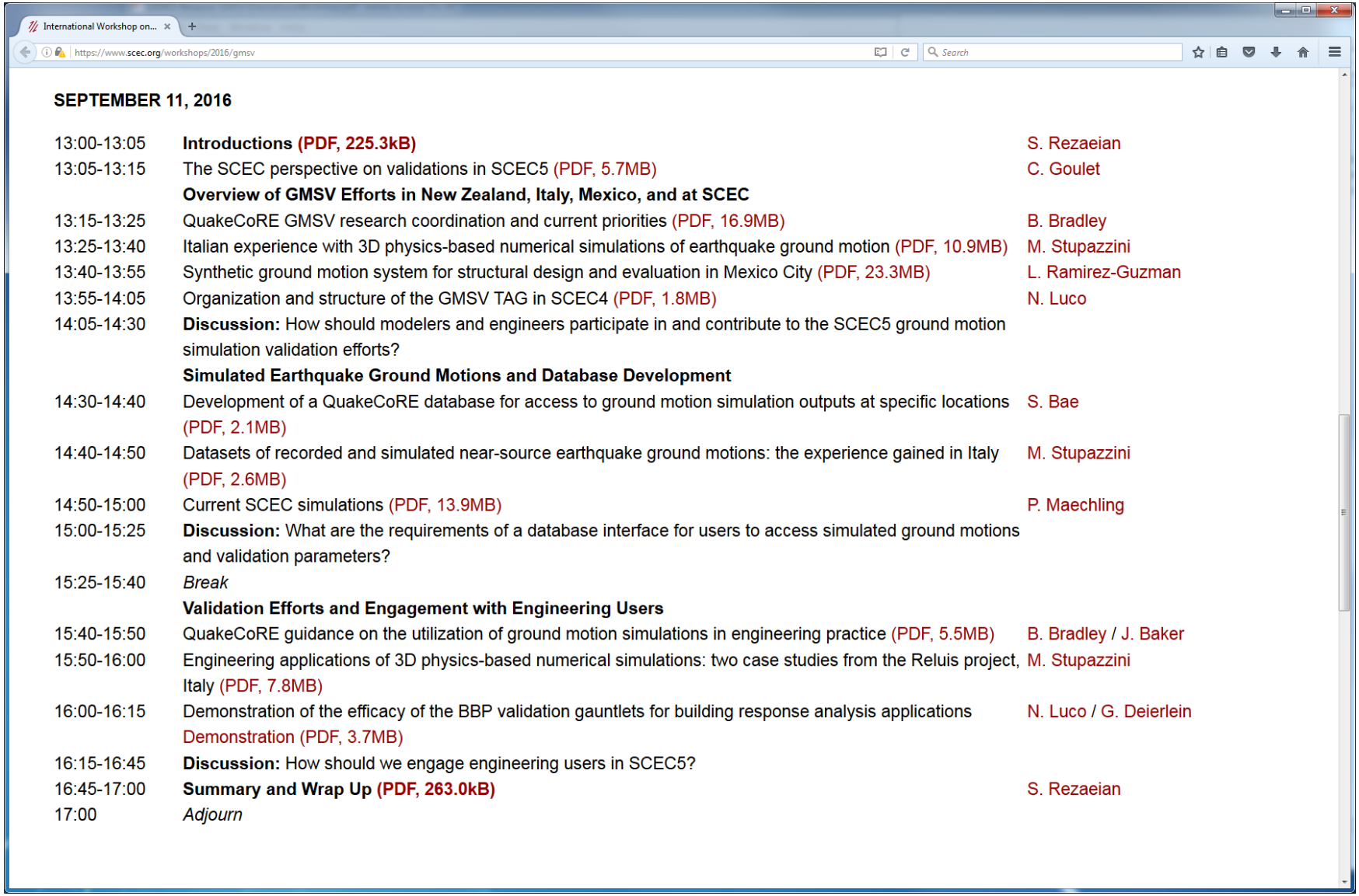
SCEC Award # 16162

Conveners:

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

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

Agenda:



SEPTEMBER 11, 2016

13:00-13:05	**Introductions (PDF, 225.3kB)**	S. Rezaeian
13:05-13:15	The SCEC perspective on validations in SCEC5 (PDF, 5.7MB)	C. Goulet
	Overview of GMSV Efforts in New Zealand, Italy, Mexico, and at SCEC	
13:15-13:25	QuakeCoRE GMSV research coordination and current priorities (PDF, 16.9MB)	B. Bradley
13:25-13:40	Italian experience with 3D physics-based numerical simulations of earthquake ground motion (PDF, 10.9MB)	M. Stupazzini
13:40-13:55	Synthetic ground motion system for structural design and evaluation in Mexico City (PDF, 23.3MB)	L. Ramirez-Guzman
13:55-14:05	Organization and structure of the GMSV TAG in SCEC4 (PDF, 1.8MB)	N. Luco
14:05-14:30	**Discussion:** How should modelers and engineers participate in and contribute to the SCEC5 ground motion simulation validation efforts?	
	Simulated Earthquake Ground Motions and Database Development	
14:30-14:40	Development of a QuakeCoRE database for access to ground motion simulation outputs at specific locations (PDF, 2.1MB)	S. Bae
14:40-14:50	Datasets of recorded and simulated near-source earthquake ground motions: the experience gained in Italy (PDF, 2.6MB)	M. Stupazzini
14:50-15:00	Current SCEC simulations (PDF, 13.9MB)	P. Maechling
15:00-15:25	**Discussion:** What are the requirements of a database interface for users to access simulated ground motions and validation parameters?	
15:25-15:40	*Break*	
	Validation Efforts and Engagement with Engineering Users	
15:40-15:50	QuakeCoRE guidance on the utilization of ground motion simulations in engineering practice (PDF, 5.5MB)	B. Bradley / J. Baker
15:50-16:00	Engineering applications of 3D physics-based numerical simulations: two case studies from the Reluis project, Italy (PDF, 7.8MB)	M. Stupazzini
16:00-16:15	Demonstration of the efficacy of the BBP validation gauntlets for building response analysis applications Demonstration (PDF, 3.7MB)	N. Luco / G. Deierlein
16:15-16:45	**Discussion:** How should we engage engineering users in SCEC5?	
16:45-17:00	**Summary and Wrap Up (PDF, 263.0kB)**	S. Rezaeian
17:00	*Adjourn*	

Participants:

PARTICIPANTS

Brad Aagaard (USGS)
Norman Abrahamson (PG&E)
John Anderson (Univ of Nevada)
Dudley Joe Andrews (retired)
Domniki Asimaki (Caltech)
Sung Bae (QuakeCoRE)
Jack Baker (Stanford Univ)
Elizabeth Barnett (SWGE)
Jeff Bayless (AECOM/UC Davis)
Sophia Belvoir (SCEC USEIT)
Gregory Beroza (Stanford University)
Glenn Biasi (UNR)
Jacobo Bielak (CMU)
Cecilia Booker (NAVY)
Elliot Bowie (U of Otago)
Brendon Bradley (U of Canterbury)
James Brune (UNR)
Scott Callaghan (SCEC/USC)
Jaziel Cambron (CICESE)
Kerry Cato (CSUSB)
Jorge Crempien (UCSB)
Steven Day (SDSU)
Gregory Deierlein (Stanford Univ)
Carola Di Alessandro (GeoPentech)
Ke Du (Stanford University)
Benchun Duan (TAMU)
Donna Eberhart-Phillips (UC Davis)
Hamed Ebrahimian (Caltech)
Edward Field (USGS, Golden)
Zhenyu Fu (SCEC UseIT/USC)
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Jose Luis Garcia-Reyes (Caltech)
Matthew Gerstenberger (GNS NZ)
Francesca Ghisetti (U of Canterbury)
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Robert Graves (USGS)
Lijam Hagos (CGS)
Alireza Haji-Soltani (U of Memphis)
Ruth Harris (USGS)
Egill Hauksson (Caltech)
Xiaohui He (USTC)
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Nadia Lapusta (Caltech)
Robin Lee (U of Canterbury)
Ting Lin (Marquette Univ)
Xin Liu (Stanford Univ)
Taojun Liu (U Colorado Boulder)
John Louie (Nevada Seismo Lab)
Nicolas Luco (USGS)
Shuo Ma (SDSU)
Philip Maechling (SCEC)
Paul Mai (KAUST)
Lingsen Meng (UCLA)
Morgan Moschetti (USGS)
Ramin Motamed (UNR)
Farzad Naeim (Farzad Naeim)
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Shiying Nie (SDSU)
Kim Olsen (SDSU)
Yajun Peng (Princeton Univ)
Shahram Pezeshk (Univ. of Memphis)
Santiago Rabade (II-UNAM)
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Doriam Restrepo (Universidad EAFIT)
Sanaz Rezaeian (USGS)
Valerie Sahakian (USGS)
Edilson Salazar Monroy (UNAM)
Bruce Shaw (Columbia Univ)
Fabio Silva (SCEC / USC)
Andreas Skarlatoudis (AECOM)
Norman Sleep (Stanford U)
Paul Somerville (AECOM)
Mark Stirling (U of Otago)
Marco Stupazzini (Munich Re)
Ricardo Taborda (U of Memphis)
Ta-liang Teng (USC)
Chris Van Houtte (Harvard Univ)
John Vidale (U Washington)
Maximilian Werner (Bristol)
Isabel White (USGS)
Andrew Whittaker (MCEER/U at Buffalo)
Kyle Withers (SDSU)
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John Yu (USC)
Farzin Zareian (UC Irvine)
Yuehua Zeng (USGS Golden)
Yongxian Zhang (CEA)
Peng Zhong (UC Irvine)

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