

## ***The workshop***

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The Joint Research Centre (JRC) hosts a three-day international workshop, within the framework of the European Community's FP7/2007-2013 Project SERIES ("Seismic Engineering Research Infrastructures for European Synergies").

The workshop is co-organised with the George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES, USA) and will present the main outcomes of the SERIES project and of parallel developments within NEES.

The event is dedicated to the memory of Prof Roy Severn, who established and led the EQUALS laboratory facility at the University of Bristol and co-ordinated seismic infrastructure projects which preceded SERIES in past EC Framework Programmes, notably ECOEST I and II and ECOLEADER.

## ***SERIES at a glance***

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European seismic engineering research suffers from extreme fragmentation of research infrastructures (RI) between countries and limited access to them by the S/T community of earthquake engineering, especially that of Europe's most seismic regions. A 23-strong consortium of the key actors in Europe's seismic engineering research (including 3 industrial beneficiaries) addresses these problems in a sustainable way via a 4-year programme of activities at an annual cost to the EC which is less than 1.35% of the total present value (€190m) of the RIs' material resources.

The project aims at bridging two gaps of RTD in experimental earthquake engineering and structural dynamics: (a) between Europe and the US and Japan, and (b) between European countries with high seismicity but less advanced RTD infrastructures on one hand and some more technologically advanced but not so seismic Member States on the other. The entire European RTD community in earthquake engineering is integrated via:

- A concerted program of Networking Activities, fostering a sustainable culture of co-operation among all research infrastructures and teams active in European earthquake engineering.
- Co-ordinated Transnational in-person Access of Users to a world class portfolio combining EU's largest PsD facility, four diverse shake tables and two centrifuges.
- Joint innovative Research toward new fundamental technologies and techniques promoting efficient and joint use of the research infrastructures.

The scope of the project covers all aspects of seismic engineering testing, with the participation of eight reaction wall pseudodynamic (PsD) facilities, ten shake table labs, EU's unique tester of bearings or isolators, EU's two major centrifuges and an instrumented site for wave propagation studies.

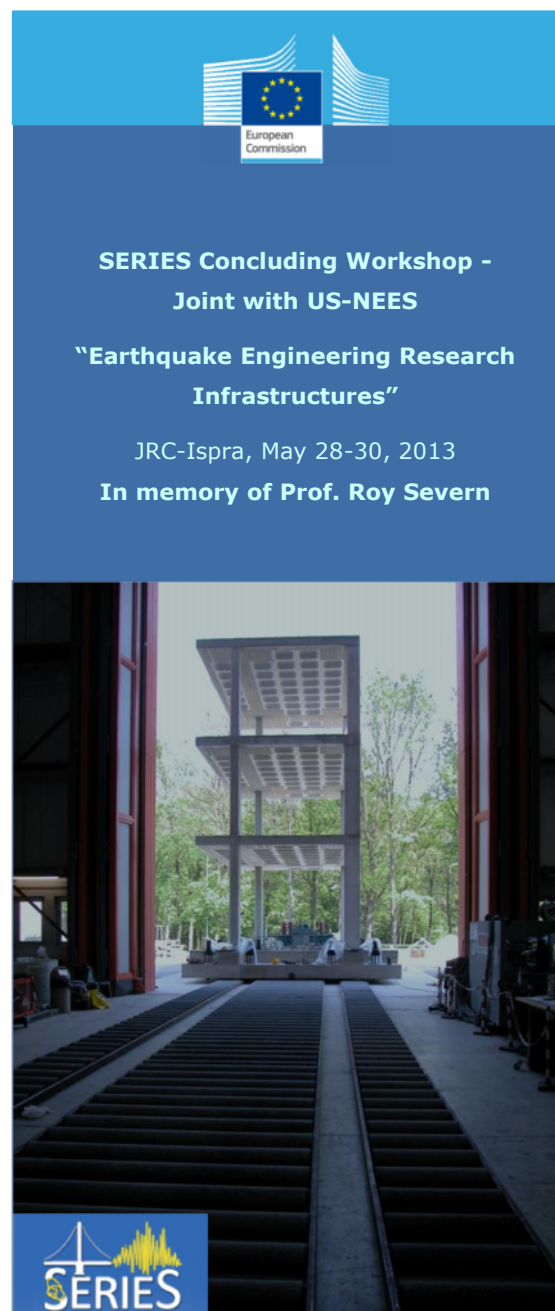
## ***Participants***

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The workshop will be attended by researchers and scientists from European and international research infrastructures on earthquake engineering, including shaking table, reaction wall, centrifuge and on-site testing facilities.

The workshop will also be attended by users of SERIES infrastructures within the Transnational Access activities of the project.

Participants from other related FP7 Projects as well as from other international research infrastructures/networks are welcome.



The banner features a blue background with the European Commission logo at the top. The text is centered and reads: "SERIES Concluding Workshop - Joint with US-NEES 'Earthquake Engineering Research Infrastructures'". Below this, it states "JRC-Ispra, May 28-30, 2013" and "In memory of Prof. Roy Severn". The bottom half of the banner shows a photograph of a large, modern building with a glass facade and a staircase leading up to it. A small SERIES logo is visible in the bottom left corner of the photograph.

## ***Event Registration***

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Participants are requested to register at the JRC registration site <https://jrc-meeting-registration.jrc.ec.europa.eu/> by 30 April 2013.

## ***Venue, dates and social events***

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The workshop will be held in Bldg. 58c, Auditorium, Joint Research Centre, European Commission, Ispra (Va), Italy on 28-30 May 2013.

The organizing Committee invites all participants to three dinners on 28, 29 and 30 May.

## ***Attendance Fees***

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There will be no registration fee for the Workshop. With the exception of invited participants, attendees are responsible for their own travel, accommodation and subsistence costs. All lunches and social dinners held during the workshop will be offered free of charge, as well as all transportation from/to the main airports and train stations to/from the hotels, meeting places and social events.

The Workshop secretariat will provide to participants any further information about travel and accommodation arrangements.

## ***Workshop Material***

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Relevant Workshop material will be distributed at the Workshop. All presentations will be available for download from the SERIES website after the Workshop [www.series.upatras.gr](http://www.series.upatras.gr)

## ***Workshop Organising Committee***

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Fabio Taucer - *Joint Research Centre*  
Michael Fardis, Dionysis Biskinis, Vassia Vayena -  
*University of Patras*  
Julio Ramirez - *Purdue University, NEES, USA*

## ***Workshop Scientific Committee***

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Michael Fardis - *University of Patras*  
Fabio Taucer - *Joint Research Centre*  
Julio Ramirez - *Purdue University, NEES, USA*  
Eduardo Cansado Carvalho - *GAPRES SA*  
Paolo E Pinto - *Università di Roma La Sapienza*  
André Plumier - *Université de Liège*  
Enrique Alarcón - *Universidad Politécnica de Madrid*  
Kostantin Meskouris - *RWTH Aachen University*

## ***Workshop Proceedings***

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Full papers will be submitted by 30 June 2013, will be peer-reviewed by two reviewers and should be of journal calibre. The Proceedings will be published by a reputed publisher. Contributing authors will receive a complimentary copy of the Proceedings.

## ***Special Session on Hybrid Simulation***

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A Special Session on Recent Advances in Hybrid Simulations is organised. The scope of this Special Session is to present recent advances on numerical methods, testing techniques and control strategies from a hybrid simulation perspective. Major focus will be given to implementation aspects of software and hardware as well as to applications to significant case studies.

## ***With the Support of***

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European Community's FP7/2007-2013 Project SERIES ("Seismic Engineering Research Infrastructures for European Synergies") under grant agreement n° 227887.

## ***Secretariat***

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**[www.series.upatras.gr](http://www.series.upatras.gr)**

## Programme

Tuesday, 28 May 2013

08:45  
09:00 Registration

09:00  
09:05 Welcome (Artur Pinto, Fabio Taucer – JRC)

Hybrid Testing  
(Chairs: Oreste Bursi, Shirley Dyke)

09:05  
09:10 Opening remarks (Oreste Bursi)

09:10  
09:30 Towards faster computations and accurate execution of real-time hybrid simulation  
*Mosalam KM, Günay S*

09:30  
09:50 Robust integrated actuator control strategy for real time hybrid simulation  
*Ou G, Dyke SJ, Wu B*

09:50  
10:10 Real-time earthquake simulation using force controlled actuators  
*Nakata N, Krug E*

10:10  
10:30 Assessment of the seismic behaviour of a retrofitted old RC highway bridge through PsD testing  
*Bursi OS, Ceravolo R, Di Sarno L, Erdik M, Paolacci F, Sartori M, Pegon P*

10:30  
10:45 Coffee Break

10:45  
11:05 Pseudo-dynamic testing with non-linear substructuring of a reinforced concrete bridge based on system identification and model updating techniques  
*Abbiati G, Bursi OS, Cazzador E, Mei Z, Paolacci F, Pegon P*

11:05  
11:25 Numerical tools for the reduction of complex dynamic models  
*Abbiati G, Bursi OS, Cazzador E, Mei Z*

11:25  
11:45 Geographically distributed continuous hybrid simulation tests using shaking tables  
*Obón Santacana F, Dorka UE*

11:45  
12:05 Pseudo-dynamic testing of a piping system based on model reduction techniques  
*Reza MS, Abbiati G, Bonelli A, Bursi OS*

12:05  
12:25 Monolithic time-integration algorithms for Hamiltonian systems suitable for real-time hybrid simulations  
*Abbiati G, Bonelli A, Bursi OS, Reza MS*

12:25  
12:45 Advanced hybrid simulation frameworks for civil structures  
*Phillips BM, Spencer BF Jr.*

12:45  
13:40 Lunch Break

13:40  
14:00 A support platform for distributed hybrid testing

*Lamata Martínez I, Obón Santacana F, Williams MS, Blakeborough A, Dorka UE*

14:00  
14:20 Dynamic substructuring for soil structure interaction using a shaking table  
*Tang Z, Dietz M, Li Z, Taylor C*

14:20  
14:40 Real-time hybrid testing for soil-structure interaction: An adaptive signal processing framework  
*Dertimanis VK, Mouzakis HP, Psycharis IN*

14:40  
15:00 Towards an implementation of the FHT technique for SSI systems using nonlinear macroelements  
*Chatzigogos CT, Dietz M, Pecker A, Tang Z*

15:00  
15:20 Roundtable discussion

15:20  
15:35 Coffee Break

SERIES Transnational Access to Centrifuge Facilities  
(Chairs: Gopal Madabhushi, Khalid Mosalam)

15:35  
15:40 Opening remarks (Gopal Madabhushi)

15:40  
16:00 Centrifuge modeling of dynamic behavior of box-shaped underground structures in sand  
*Ülgen D, Sağlam S, Özkan MY, Chazelas J-L*

16:00  
16:20 Investigation of the seismic behaviour of shallow rectangular underground structures in soft soils using centrifuge experiments  
*Tsinidis G, Rovithis E, Pitilakis K, Chazelas J-L*

16:20  
16:40 Investigation of several aspects affecting the seismic behaviour of shallow rectangular underground structures in soft soils  
*Tsinidis G, Heron C, Madabhushi SPG, Pitilakis K, Stringer M*

16:40  
17:00 Experimental verification of shallow foundation performance under earthquake-induced liquefaction  
*Karamitros DK, Cilingir U, Bouckovalas GD, Madabhushi SPG, Papadimitriou AG, Haigh SK*

17:00  
17:20 Centrifuge modelling of the performance of liquefaction mitigation measures for shallow foundations  
*Marques A, Coelho P, Haigh SK, Madabhushi SPG*

17:20  
17:40 Centrifuge modeling of pairs of flexible retaining walls in saturated sand under seismic actions  
*Aversa S, De Sanctis L, Maiorano RMS, Tricarico M, Viggiani G, Conti R, Madabhushi SPG, Stringer M, Heron C*

17:40  
18:00 Experimental and numerical investigations of nonlinearity in soils using advanced laboratory-scaled models: An application to the Rome historical centre  
*Bozzano F, Bretschneider A, Giacomini AC, Martino S, Scarascia Mugnozza G, Escoffier S, Lenti L, Chazelas J-L, Favraud C, Macé D*

18:00  
18:20 Roundtable discussion

20:00 Social Dinner

Wednesday, 29 May 2013

US-NEES developments  
(Chairs: Julio Ramirez, Artur Pinto)

09:00	
09:05	<b>Opening remarks (Julio Ramirez)</b>
09:05	<b>The George E. Brown, Jr., Network for Earthquake Engineering Simulation (NEES): Accelerating improvements in seismic design and performance by serving as a global collaborative laboratory for discovery and innovation</b> <i>Ramirez J</i>
09:25	<b>Promoting re-use of Earthquake Engineering data through the NEEShub</b> <i>Browning J</i>
09:45	<b>Re-use of experimental earthquake data for research: Three illustrative examples</b> <i>Van de Lindt JW</i>
10:05	<b>Communicating earthquake engineering: The education, outreach, and training activities of the George E. Brown, Jr. Network for Earthquake Engineering Simulations</b> <i>Fossum B</i>
10:25	<b>Damping estimation from seismic records</b> <i>Bernal D</i>
10:45	
11:00	<b>Coffee Break</b>

SERIES Networking Activities: Distributed Database and Qualification of Research Infrastructures  
(Chairs: Pierre Pegon, JoAnn Browning)

11:00	
11:05	<b>Opening remarks (Pierre Pegon)</b>
11:05	<b>A faceted lightweight ontology for earthquake engineering research projects and experiments</b> <i>Hasan MR, Farazi F, Bursi OS, Reza MS</i>
11:25	<b>The SERIES Virtual Database: Architecture and implementation</b> <i>Lamata Martinez I, Ioannidis I, Fidas C, Williams M, Pegon P</i>
11:45	<b>The SERIES Virtual Database: Exchange format, local DBs and central portal interface</b> <i>Bosi A, Kotinas I, Martinez IL, Bousias S, Chazelas J-L, Dietz M, Hasan MR, Madabhushi SPG, Prota A, Blakeborough T, Pegon P</i>
12:05	<b>Qualification of seismic research testing facilities in Europe</b> <i>Zola M, Taucer F</i>
12:25	<b>Roundtable discussion (US-NEES developments and SERIES Networking Activities)</b>
12:45	
13:45	<b>Lunch Break</b>

SERIES Transnational Access to Shaking Table Facilities on masonry, RC and steel structures  
(Chairs: Alberto Pavese, Brian Phillips)

13:45	
13:50	<b>Opening remarks (Alberto Pavese)</b>
13:50	<b>Full scale testing of modern unreinforced thermal insulation clay block masonry houses</b> <i>Lu S, Jäger A, Mendes L, Campos Costa A, Candeias P, Coelho E, Degée H, Mordant C, Sendova V, Rakicevic ZT, Tomazevic M</i>
14:10	<b>Assessment of innovative solutions for non-load bearing masonry enclosures</b> <i>Leite J, Lourenço PB, Vintzileou E, Palieraki V, Correia AA, Candeias P, Campos Costa A, Coelho E</i>
14:30	<b>Seismic behaviour of L- and T-shaped unreinforced masonry shear walls</b> <i>Mordant C, Dietz M, Vasseur L, Degée H</i>
14:50	<b>Shake table testing of a half scaled RC-URM walls structure</b> <i>Tondelli M, Petry S, Lanese I, Beyer K, Peloso S</i>
15:10	<b>Experimental and numerical investigation of torsionally irregular RC shear wall buildings with Rutherma breakers</b> <i>Yakut A, Le Maout A, Richard B, Ragueneau F, Atanasiu GM, Scheer S, Diler S</i>
15:30	<b>Assessment of the seismic response of concentrically-braced steel frames</b> <i>Broderick BM, Hunt A, Mongabure P, LeMaout A, Goggins JM, Salawdeh S, O'Reilly G, Beg D, Moze P, Sinur F, Elghazouli AY, Plumier A</i>
15:50	
15:50	<b>Coffee Break</b>
16:05	
16:05	<b>SERIES Transnational Access to Shaking Table Facilities on wood structures / General on Experimental facilities</b> (Chairs: Alberto Pavese, Narutoshi Nakata)
16:05	<b>Seismic performance of laminated wood frames with moment connections under seismic loads: Experimental investigation</b> <i>Kasal B, Heiduschke A, Pospisil S, Urushadze S, Zembaty Z</i>
16:25	<b>Investigation of seismic performance of multi-storey timber buildings</b> <i>Piazza M, Tomasi R, Campos Costa A, Candeias P</i>
16:45	<b>Experimental study on seismic performances of precast concrete shear wall with joint connecting beam</b> <i>Lu X, Wang D, Zhao B</i>
17:05	<b>Full-scale PsD testing of the SAFECAST three-storey precast concrete buildings</b> <i>Bournas D, Negro P, Molina F-J</i>
17:25	<b>Experimental earthquake engineering research in LNEC: Contribution to global seismic performance assessment of structures</b> <i>Coelho E, Campos Costa A, Candeias P, Mendes L, Correia A</i>
17:45	
18:05	<b>Roundtable discussion</b>
20:00	<b>Social Dinner</b>

**Thursday, 30 May 2013**

Analytical and Experimental work on soil structure interaction, wave propagation and field testing, including SERIES Transnational Access to Shaking Table Facilities  
(Chairs: Alain Pecker, Dionisio Bernal)

09:00	
09:05	<b>Opening remarks (Alain Pecker)</b>
09:05	<b>Caisson foundations subjected to seismic faulting: Reduced-scale physical modelling</b> <i>Anastasopoulos I, Zarzouras O, Georgarakos T, Drossos V, Gazetas G</i>
09:25	<b>Effect of soil structure interaction on higher modes participation</b> <i>Mirfattah SA, Mirfattah SK</i>
09:45	<b>Estimation of soil structure interaction effects, considering the frequency content of the motion</b> <i>Mirfattah SH, Mirfattah SA</i>
10:05	<b>Development of new infinite element for numerical simulation of wave propagation in soil media</b> <i>Sesov V, Edip K, Cvetanovska J</i>
10:25	<b>Coffee Break</b>
10:40	<b>Design and construction of laminar container for 1-g shaking table tests</b> <i>Sesov V, Cvetanovska J, Edip K, Rakicevic ZT</i>
11:00	<b>Analysis of the dynamic behavior of squat silos containing grain-like material subjected to shaking table tests</b> <i>Foti D, Ivorra S, Trombetti T, Silvestri S, Gasparini G, Taylor C, Dietz M</i>
11:20	<b>Study of multi-building interactions and site-city effect through an idealized experimental model</b> <i>Schwan L, Boutin C, Dietz M, Padron LA, Bard P-Y, Castellaro S, Ibraim E, Maeso O, Aznárez JJ, Taylor C</i>
11:40	<b>EuroProteas: A full-scale experimental facility for soil-foundation-structure interaction studies</b> <i>Pitilakis D, Rovithis E, Anastasiadis A, Pitilakis K</i>
12:00	<b>Roundtable discussion</b>
12:20	<b>Lunch break</b>
13:15	

13:15	<b>Visit to the ELSA laboratory</b>
14:15	<b>Analytical and Experimental Techniques / SERIES Transnational Access to Reaction Wall Facility (Chairs: Fabio Taucer, John Van de Lindt)</b>
14:15	<b>Opening remarks (Fabio Taucer)</b>
14:20	<b>In-situ seismic performance tests of a scoured bridge</b> <i>Chang K-C</i>
14:40	<b>Validation of a visual deformation measurement system</b> <i>Binbir E, Demir C, Ispir M, Ilki A</i>
15:00	<b>Development of wireless sensors for shake table and full scale testing and health monitoring of structures</b> <i>Rakicevic ZT, Markovski I, Filipovski D, Micajkov S, Garevski M</i>
15:20	<b>Recent advances in seismic design of RC tall buildings using ultra-high-strength materials in Taiwan</b> <i>Hwang S-J</i>
15:40	<b>Refined and simplified numerical models of an isolated old highway bridge for PsD tests</b> <i>Paolacci F, Alessandri S, Mohamad A, Corritore D, Derisi R</i>
16:00	<b>Full-scale experimental validation of dual eccentrically braced frame with removable links</b> <i>Stratan A, Dubina D, Ioan A, Taucer F, Poljansek M</i>
16:20	<b>Roundtable discussion</b>
16:35	<b>Coffee Break</b>
16:50	<b>Conclusions and Recommendations (Michael Fardis, Julio Ramirez, SERIES External Scientific Committee)</b>
17:20	<b>A Tribute to Roy Severn (Colin Taylor)</b>
20:00	<b>Social Dinner</b>