3rd version

May 23rd, 2019
Local Organizing Committee of ESG6

ESG6 Call for Blind Prediction Participation

The first International Symposium on the Effects of Surface Geology on Seismic Motion (ESG1) was held during 1992 in Odawara, Japan. The inaugural ESG1 symposium conducted blind prediction experiments designed to understand the observed amplification of seismic motions in Ashigara Valley (Kanagawa Prefecture, Japan) and in Turkey Flat (California, U.S.A.). The following ESG2 symposium, held during 1998 in Yokohama, Japan, focused on simultaneous simulation of the near-source strong motion observed during the 1995 Kobe Earthquake. ESG3 was held during 2006 in Grenoble, France, where blind tests were also conducted; the subsurface structure was empirically estimated using array microtremors and ground motions were numerically simulated for sites in Japan and France. ESG4, held during 2011 in Santa Barbara, USA, and ESG5, during 2017 in Taipei, Taiwan, mainly focused on V_{S30} issues and site effects (respectively) related to the shallow structure. No experiments were conducted for the ESG4 and ESG5 symposiums.

In the tradition of ESG experiments, the next ESG6 conducts blind predictions to identify the subsurface structure, followed by simulations of ground motions while considering the estimated subsurface structure, for an undisclosed site in the Kumamoto Prefecture, Japan. Consistent with the ESG international scheme, The ESG6 international symposium will take place in Kyoto during 15–17 March 2021. The ESG6 Blind Prediction is neither a drill nor for training purposes. Moreover, ESG6 neither plans to exercise the state-of-knowledge for estimating subsurface structures nor to predict ground motions in an idealized environment where all necessary information are readily available. Rather, ESG6 intends to improve our understanding about the state-of-art and its effects on an environment where information are sparse or lacking, as occurs in practice.

Individual and/or team participants who are interested in the exercise are welcomed to contribute to any part of the Blind Prediction.

The Blind Prediction will focus on identifying the subsurface structure and/or simulating the weak ground motion, as well as the mainshock of the 2016 Kumamoto Earthquake, at a strong motion observation site in Kumamoto Prefecture, Japan, where undisclosed strong motion data have yet to be released (unpublished).

The Blind Prediction will consist of three steps. Participants will be asked to submit their results, step-by-step (see below), and submitting results for only one (or, less than full participation) part(s) of the Blind Prediction is also encouraged. Participants may stop or start at any part of the exercise.

Step 1. Identification of the subsurface structure at the site

Several observations will be recorded to collect data for use with non-invasive analysis techniques to investigate the subsurface velocity structure. All information about the array microtremor and MASW data, as well as metadata, will be distributed to the participants. The participants can choose from any technique(s) that he/she decides is the best use of the distributed data to identify the subsurface velocity structure.

These aforementioned elements relate to the COSMOS (Consortium of Organizations for Strong Motion Observation Systems, www.strongmotion.org) International Guidelines for Applying Noninvasive Surface-based Methods When Characterizing Seismic Site Conditions project—these observations were conducted to partially fulfill the COSMOS Guidelines development for identifying subsurface structure.

Step 2. Simulation of weak motions observed at the site

The target weak motion observations to be selected will be limited to linear soil response. The participant is encouraged to simulate the weak motions based on the participant's resultant velocity model in Step 1; however, if the participant lacks or disregards results from Step 1, a generic one-dimensional velocity structure model will be distributed by the Committee. Weak motion data of earthquakes (excluding the target weak motion) will be distributed. Source parameters of earthquakes for weak motions will also be distributed in case the participants need the information.

Step 3. Simulation of strong motion observed at the site during the mainshock of the 2016 Kumamoto Earthquake

The strong motion observations recorded at the surface will include non-linear soil response. Information about the ground motions observed during the mainshock of the 2016 Kumamoto Earthquake at a relatively stiff site about few kilometers north-west of the target site will be distributed. Additional information about the shallow velocity structure at the site will also be distributed. The information about the source rupture process model(s) of the mainshock of the 2016 Kumamoto earthquake that are open to the public will be included in the distributed information.

Expected information and data to be distributed:

1. Array microtremor data and MASW data recorded at the site for Step 1.
2. Several weak motion data of earthquakes, excluding the target weak motion, observed at the site for Step 2.
3. Ground motion data of foreshock and aftershock of the 2016 Kumamoto earthquake, excluding the target motion, observed at the site for Step 3.
4. Source parameters of earthquakes for the weak motions.
5. Ground motion records of the mainshock of the 2016 Kumamoto earthquake at a relatively stiff site near the target site.
6. Generic one-dimensional velocity structure for Steps 2 and 3.
7. Information about the source rupture process model(s) of the mainshock of the 2016 Kumamoto earthquake.

Results to be submitted:

1. One-dimensional velocity structure model inverted from the array microtremor data for Step 1.
2. Time series of the predicted broadband weak motion acceleration and velocity for Step 2.
3. Time series of the predicted broadband strong motion acceleration and velocity for Step 3.
4. Non-linear response information used for/derived from the analysis for Step 3.
5. Explanation of the methodology and the results. In addition, point(s) of discussion that the participants want to address in the Blind Prediction session.

Format for submission of the results will be specified when the information and data for will be distributed.

Schedule:

January 29th,	2019	Call for blind prediction participation
		Announcement of the first circular of ESG6
April 19th,	2019	Call for blind prediction participation (2nd version)
May 23rd,	2019	Call for blind prediction participation (3rd version)
June 28th,	**2019**	**Deadline for statement of interest to participate in the blind prediction (for Steps 1, 2 and 3)**
July 1st,	2019	Distribution of data for Step 1
		Announcement of the second circular of ESG6
September 1st,	*2019*	*Call for abstracts for regular sessions of ESG6*
October 1st,	*2019*	*Exhibition registration open*
December 6th,	**2019**	**Deadline for submitting results of Step 1 and abstracts**
December 6th	*2019*	*Deadline for abstracts for regular sessions of ESG6*
December 20th,	2019	Distribution of additional information for Steps 2 and 3
March 1st,	2020	Distribution of generic one-dimensional velocity structure model
May 1st,	*2020*	*Registration open*
July 30th,	**2020**	**Deadline for extended abstracts for results of Step 1**
		Deadline for extended abstracts for regular sessions of ESG6
August 31st,	**2020**	**Deadline for submitting results of Steps 2 and 3 and abstracts**
September 30th	*2020*	*Early bird registration deadline*
December 18th,	**2020**	**Deadline for extended abstracts for results of Steps 2 and 3**
January 31st,	*2021*	*Online registration deadline*

March 15th-17th,2021 ESG6

The schedule written in italic are for the ESG6 and related events.

Those who plan to participate in the blind prediction, please contact the organizing committee by the following contact address.

Contact: esg6-bp@jaee.gr.jp, Web site: http://www.esg6.jp/