

April 19th, 2019

International committee of Blind Prediction for ESG6

ESG6 Call for Blind Prediction Participation

During the first international symposium on Effects of Surface Geology on Seismic Motion (ESG) that was held at Odawara, Japan in 1992, blind prediction experiments to identify the amplification characteristics of the Ashigara valley was conducted. Then in 1998 at Yokohama, Japan, ESG2 focused on the simultaneous simulation of the near-source strong motion observed during the 1995 Kobe Earthquake. ESG3 was held in Grenoble, France in 2006, which conducted blind tests for identifying the subsurface structure using array microtremors and simulating ground motion by numerical techniques. ESG4, which was held at Santa Barbara, USA and ESG5, which was held at Taipei, Taiwan mainly focused on the Vs30 issues and site effects related to the shallow structure, respectively.

Regarding to the previously conducted blind prediction/tests for ESG, a blind prediction exercise (The Blind Prediction) to identify the subsurface structure and then to simulate the ground motions considering the identified subsurface structure, at a site in Kumamoto Prefecture, Japan will take place in ESG6 to be held in Kyoto in March 2021. This Blind Prediction is not just a drill or training to understand our ability to identify the subsurface structure and/or predict ground motions in an idealized environment that all necessary information are available, but to understand the performance of our methods in an environment that some of the necessary information are lacking, just as in a real-life situation.

All those who are interested in the exercise are welcome to participate in 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 the strong motion data are not yet disclosed.

The Blind Prediction will consist of three steps. The participants will be asked to submit their results, step by step, but submitting their results of only one part of the Blind Prediction is also welcome. 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 conducted to collect data for non-invasive techniques to investigate the subsurface velocity structure. All the information about the array microtremor and MASW data and the data itself will be distributed to the participants, and the participants can choose from any technique that can make use of the distributed data to identify the subsurface velocity structure.

In order to collaborate with the COSMOS (Consortium of Organizations for Strong Motion Observation Systems, www.strongmotion.org) project, the observations were conducted to fulfill a part of the COSMOS guideline to identify the subsurface structure.

Step 2. Simulation of weak motions observed at the site

The target weak motion will be selected so that it will be limited to linear soil response. It is encouraged to simulate the weak motion based on the identified velocity model in step 1, but if the participant needs a velocity model, a preferred one-dimensional velocity structure model will be distributed from 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 at the surface will include non-linear soil response. Information about the ground motion 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 be distributed. The source rupture process model(s) of the mainshock of the 2016 Kumamoto earthquake will be distributed in case the participants need the information.

Expected information and data to be distributed:

1. Array microtremor data and MASW data observed at the site.
2. Several weak motion data of earthquakes, excluding the target weak motion, observed at the site.
3. Ground motion data of mainshock of the 2016 Kumamoto earthquake, excluding the target motion, observed at the site.
4. Source parameters of earthquakes for the weak motions.
 - Ground motion data of mainshock of the 2016 Kumamoto earthquake at a relatively stiff site near the target site.
 - Source rupture process model of the mainshock of the 2016 Kumamoto earthquake (tentative).

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.

~~The tentative results of Steps 1 and 2 are planned to be introduced in the organized session at the 17th World Conference on Earthquake Engineering, which will be held at Sendai in September 2020.~~

The organized session related to the Blind Prediction at the 17th World Conference on Earthquake Engineering is cancelled.

Schedule (tentative):

- 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 30th, 2019 Deadline for stating participation in the blind prediction
- June 30th, 2019 Distribution of data for Step 1
Announcement of the second circular of ESG6
- September 2019 Call for abstracts for regular sessions of ESG6*
- October 2019 Exhibition registration Open*
- December 6th, 2019 Deadline for submitting results of Step 1
- December 20th, 2019 Distribution of additional information for Steps 2 and 3
- December 2019 Deadline for abstracts for regular sessions of ESG6*
- May 2020 Registration Open*
Deadline for extended abstracts for BP session
Early bird registration deadline
- November 30th, 2020 Deadline for submitting results of Steps 2 and 3
- December 18th, 2020 Deadline for extended abstracts for blind prediction results
- January 2021 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/>