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 one-dimensional subsurface velocity structure of sites in 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 simulating the non-linear behavior of the soil response and the effect of the three-dimensional basin. 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 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 collected data 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.

Additionally, in order to collaborate with the COSMOS project, the participants are encouraged to follow the COSMOS guideline to identify the subsurface structure.

Step 2. Simulation of weak motion observed at the site

The weak motion should be simulated based on the identified velocity model. The weak motion will be selected so that it will be limited to linear soil response. If the participant needs a velocity model, they should collaborate with other participants that can identify the velocity model. A preferred one-dimensional velocity structure model will NOT be distributed to the participants. Array microtremor data, MASW data and weak and strong motion data of earthquakes (excluding the target weak and strong motions) will be distributed. Source parameters of earthquakes for weak and strong 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. Additional information about the ground motion observed during the mainshock of the 2016 Kumamoto Earthquake at a relatively stiff site near the target site and the information about the velocity structure at the site will be distributed. The source rupture process model(s) of the mainshock of the 2016 Kumamoto earthquake is planned to be distributed to the participants.

Expected information and data to be distributed:

1. Array microtremor data and MASW data observed at the site.
2. Several weak and strong motion data of earthquakes, excluding the target motions, observed at the site.
3. Source parameters of earthquakes for the weak and strong motions.
-   Ground motion data of mainshock of the 2016 Kumamoto earthquake at a relatively stiff site near the target site (tentative).
-   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 and/or weak and strong motion data, for Step 1.
2. Time series of the predicted broadband weak motion acceleration for Step 2.
3. Time series of the predicted broadband strong motion acceleration and velocity for Step 3.
3'. Non-linear response information used for/derived from the analysis.

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.

Schedule (tentative):

January	2019	Call for blind prediction participation
		Announcement of the first circular
May	2019	Deadline for stating participation in the blind prediction
June	2019	Distribution of data for Steps 1 and 2
		Announcement of the second circular
September	*2019*	*Call for abstracts*
October	*2019*	*Exhibition registration Open*
December	2019	Deadline for submitting results of Steps 1 and 2
		Distribution of additional information
		Deadline for abstracts
May	*2020*	*Registration Open*
September	2020	Deadline for submitting results of Step 3 (Sep. 10)
		Deadline for extended abstracts
		Early bird registration deadline
		17WCEE (Sep. 13 to 18)
December	2020	Deadline for extended abstracts for blind prediction results
January	*2021*	*Registration deadline*
March	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/