

Newsletters

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More reliable physics in seismic hazard assessment (SHA) for disaster risk reduction (DRR)
(More reliable physics in SHA for DRR)

This issue

15th General Assembly of Asian Seismological Commission (ASC)

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Warm regards from Prof. Li Li

15th General Assembly of Asian Seismological Commission (ASC)

The 15th General Assembly of Asian Seismological Commission (ASC) is going to be held in Antalya, Turkey, Nov 03-07, 2024, with its sessions being revised and expanded. JWG has submitted a session 'Physics-based seismic hazard assessment: recent progress and scientific debate'. Prof. Li Li, the ASC secretary, has approved it. It will be updated in the upcoming promotional poster and website.



Session scope: Since recent years physics-based seismic hazard assessment has attracted wide spreading attention in seismological and engineering communities. The developments of neo-deterministic seismic hazard assessment (NDSHA) as a new generation of deterministic seismic hazard assessment well captures the tensor nature of strong ground motion based on the up-to-date seismology, data science, and computational technology, and has been applied to several places. This led to the necessity of comparative studies, testing of the results by earthquake cases with data intensive observations, and communicating with engineering and emergency management communities for its application. The research and its application play an important role in the endeavor of disaster risk reduction (DRR). The proposed session includes but is

not limited to the theoretical, computational, and application aspects of NDSHA, with comparison with other approaches, and related scientific discussion.

The text above is the original version of the scope of the session. Suggestions for its further revision are welcome. Please contact the secretaries of the JWG and formulate suggestions for volunteers to act as conveners or recommend conveners (and key speakers).

2024 Noto Peninsula, Japan $M_w7.5$ earthquake

MCE size, using M_{design} , is formally defined as the largest so far observed magnitude plus 2 or 3 times the global σ_M value (for details see earlier Newsletters, e.g. Vol. 1 No.5 December 1, 2023). Thus, M_{design} supplies a quite natural lower bound of MCE magnitude for any study area. The Japan quake is a clear example of the capability of NDSHA to assess MCE in a quick and reliable way. In fact, in the area of Noto Peninsula, past seismicity (since 1900) gives $M_{design}=(6.7-6.8)+0.7=7.4-7.5$, not so different from the $M_w7.5$ of the quake occurred on 2024-01-01 07:10:09 (UTC) (location 37.498°N 137.242°E, depth 10 km). In other words, since the 1984 and 2007 events (M 6.7-6.8), M about 7.5 could have been expeditiously “PREDICTED” for the MCE of the area. Geller (2011) points out that the national seismic hazard map published yearly by the Japanese government failed to predict seismic hazard since 1979: deadly earthquakes that have caused 10 or more fatalities in Japan have occurred in places where seismic risk is designated to be low.

References:

Geller, R. J., 2011. Shake-up time for Japanese seismology. *Nature*, 472, 407-409. DOI: 10.1038/nature10105.

2024 Wushi, Aksu Prefecture, Xinjiang, China $M_w7.0$ earthquake

Reported by China Earthquake Networks Center (CENC), a $M_w7.0$ earthquake struck Wushi County, Aksu Prefecture, Xinjiang, China at 18:09:04 (UTC) on 2024-01-22. The epicenter is estimated to be at 41.26°N 78.63°E with focal depth at 22 km. The maximum event in this area before the Wushi $M_w7.0$ quake is a M6.4 event in 1987 (41.26°N 79.17°E). Accordingly, $M_{design}=6.4+0.7=7.1$ can be immediately defined, thus the Wushi $M_w7.0$ within ~45 km from the epicenter of the 1987 M6.4 event in the Wushi County is enveloped by the expeditious prediction of MCE for the area. The value $M=7.1$ for MCE should be considered both at the stage of rescue and reconstruction.

Warm encouragements from Prof. Zhongliang Wu

It's nice to see that the preparatory joint working group (pJWG) is on track, as represented by its Monthly Newsletters since August, plus 2 supplementary issues. In the whole process we would like to thank the

guidance of Prof. Panza as well as other scientific advisors.

Facilitating the organization of the pJWG while promoting the preparatory work in the framework of the ASC and the AfSC will be the focus of work at present time. It is hoped that sometimes the word 'preparatory' be removed from the present title of our working group, and JWG be a formal member of ASC and AfSC.

It is worth mentioning the forthcoming JWG activities in preparation. The first is the conference on statistical seismology next March in which JWG acts as its co-sponsor, and the second is the Assembly of the Asian Seismological Commission next November in which JWG is preparing its session, somehow the first JWG session in the ASC Assembly. To my knowledge ASC is also discussing with Yan for inviting him to assist the maintenance of the ASC website, that is a good thing for the working group. On the African side, the newly founded African Disaster Mitigation Research Center listed the work of JWG among its program in 2024, reflecting the endorsement to the works of JWG from the AfSC and local institutions. And I am sure that in the next AfSC Assembly JWG will also play an active role.

Earthquakes don't wait for our research to be finished. Therefore, we must keep an 'interactive mode' with earthquakes. This webinar, although with limited participation due to various reasons (for me, ironically it is the problem of the connection), reflects the working status of JWG. Indeed, through the continuous exchange and cooperation, innovative outcomes are attainable and will lower the risk of seismic disasters for society.

Thank you.

Warm regards from Prof. Li Li

On behalf of the Asian Seismological Commission (ASC), taking the opportunity of the Webinar on the 2023 Morocco $M_s6.8$ Earthquake and Seismic Hazard Assessment, I would like to convey my warm regards to the Joint Working Group on Neo-deterministic Seismic Hazard Assessment (JWG NDSHA), and express my thanks to the African Seismological Commission (AfSC) for cooperation in supporting the works of this joint working group. Reduction of seismic disaster risk has been one of the research focuses of the ASC as well as the AfSC. I hope that with the international and interdisciplinary cooperation we may be doing a better and better job in this field. I hope to meet you the next year in the Assembly of ASC in which the JWG is going to have its first technical session. Thank you.

Li Li, secretary general of Asian Seismological Commission and vice president of the International Association of Seismology and Physics of the Earth's Interior (IASPEI)

Correction: the last picture in the Newsletter Vol 2, issue 1

The GPT4.0 experiment distributed with Newsletter Vol 2, issue 1 is an example of misleading apparently

correct statements. It could be nice if you send your comments. One can easily find that GPT4.0 has difficulties in producing the figure with texts, although revised by natural intelligence. Accordingly, we just remove the figure produced by GPT4.0. The final reply of GPT4.0 for this problem follows: I apologize for the continued errors in the text of the generated images. Unfortunately, the current technology may not always accurately reflect complex text requirements in image generation. I recommend using professional image editing software or services to ensure the accuracy of the text. If you need assistance in any other matters, please let me know. I apologize again for not being able to meet your request.

Contact address:

Yan Zhang: zhangyan@cea-igp.ac.cn | Mohamed El Gabry: elgabry@nriag.sci.eg