

RED-ACT Report

Real-time Earthquake Damage Assessment using City-scale Time-history analysis

June 04, M6.1 Japan Torishima Kinkai Earthquake

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Acknowledgments and Disclaimer

The authors are grateful for the data provided by **K-NET** and **KiK-net**. This analysis is for research only. The actual damage resulting from the earthquake should be determined according to the site investigation.

Scientific background of this report can be found at:

http://www.luxinzheng.net/software/Real-Time_Report.pdf

1. Introduction to the earthquake event

At 13:40 04 Jun 2019 (Local Time, UTC +9), an **M 6.1 (JMA)** earthquake occurred in **Japan Torishima Kinka**. The epicenter was located at **139.8 29.1**, with a depth of **440.0 km**.

2. Recorded ground motions

13 ground motions near to epicenter of this earthquake were analyzed. The names and locations of the stations can be found Table 1. The maximal recorded peak ground acceleration (PGA) is **2.6 cm/s/s**. The corresponding response spectra in comparison with the design spectra specified in the Chinese Code for Seismic Design of Buildings are shown in Figure 1.

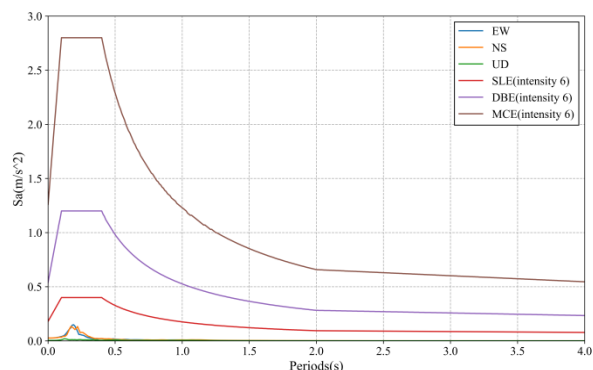


Figure 1 Response spectra of the recorded ground motions with maximal PGA

3. Damage analysis of the target region subjected to the recorded ground motions

Using the real-time ground motions obtained from the strong motion networks and the **city-scale nonlinear time-history analysis** (see the **Appendix of this report**), the damage ratios of buildings located in different places can be obtained. The building damage distribution and the human uncomfotableness distribution near to different stations is shown in Figure 2 and Figure 3, respectively. These outcomes can provide a reference for post-earthquake rescue work.

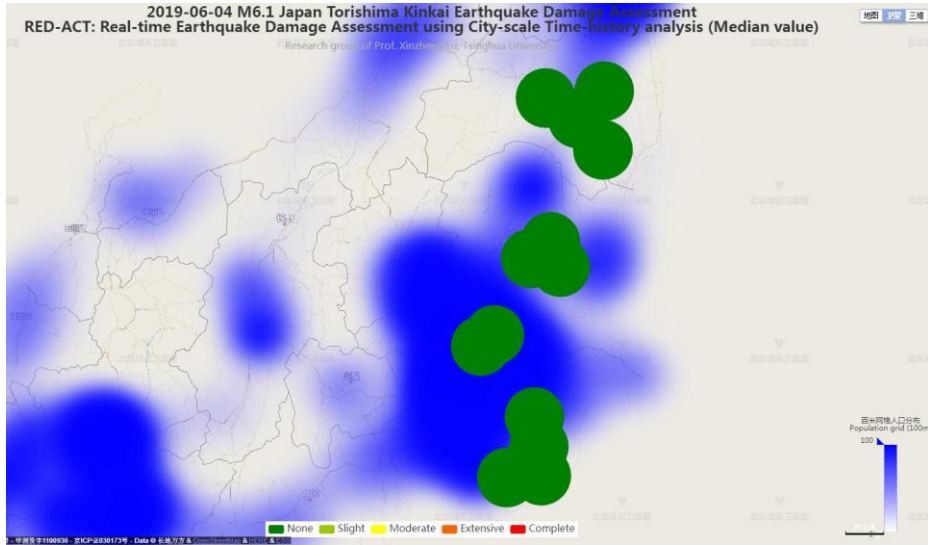


Figure 2 Damage ratio distribution of the buildings near to different stations

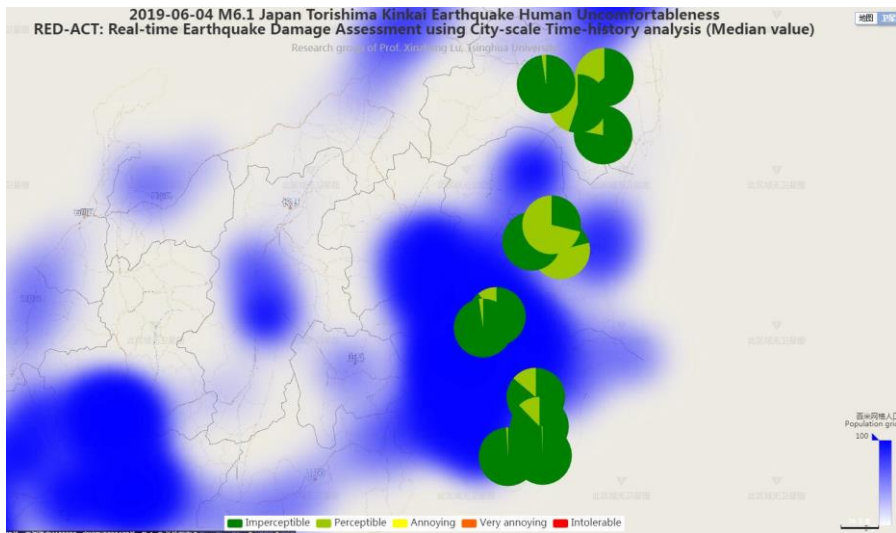


Figure 3 Human uncomfortableness distribution near to different stations

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Table 1 Names and locations of the strong motion stations

No.	Station Name	Longitude	Latitude
1	CHB014	140.049	35.4769
2	CHB017	140.076	35.2988
3	CHB019	139.835	35.1105
4	CHB020	140.102	35.1155
5	FKS008	140.567	37.4363
6	FKS013	140.556	37.09
7	FKS017	140.369	37.2842
8	FKS024	140.132	37.3957
9	IBR005	140.237	36.3851

10	SIT008	139.746	35.9829
11	SIT010	139.648	35.9065
12	TCG013	140.023	36.4368
13	TCG014	140.174	36.545