240th Regular Open Seminar （2018 Nov 28）

Title : Seismic simulation of wooden houses

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Related RISH mission : Mission 4 (Development and Utilization of Wood-based Sustainable Materials in Harmony with the Human Living Environment)

Abstract :

To prevent casualties during a large earthquake, preliminary safety assessment of residential houses is one of the most important measures. During the Great Hanshin–Awaji Earthquake, wooden houses without sufficient seismic capacity were heavily damaged, and studies on the seismic performance of wooden houses have been actively conducted. To investigate the safety of wooden houses during large earthquakes, it is important to assess the limit status and understand the possibility of collapse. Although the shaking table test is the most effective solution for this issue, a large cost is required, and experiments on the variety of specifications of wooden houses may be impossible. A numerical analysis by computer simulation is an effective way to assess the seismic performance of structures as an alternative to shaking table tests.

The seismic simulation software "wallstat" was developed taking advantage of a lot of accumulation of knowledge for shaking table tests of wooden house from this kind of situation. You can model the wooden house three-dimensionally on your PC and give various earthquakes such as past earthquakes and envisaged earthquakes to confirm the seismic performance of the wooden houses by moving images. In this seminar, I will introduce the outline of this software and history of development.
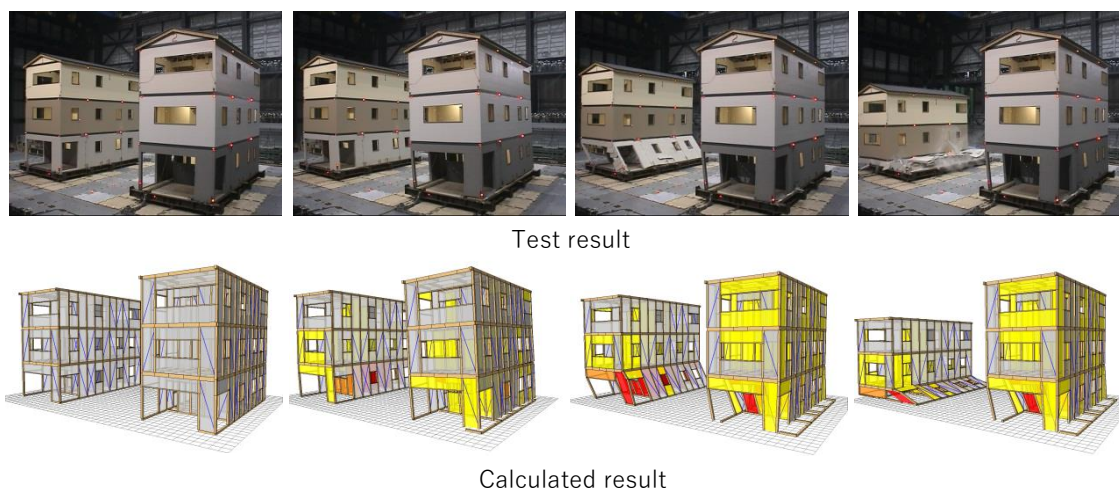
Test result

Calculated result

Fig. 1 Reproductive analysis by "wallstat" for real-size shaking table test of wooden houses.