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# Prediction method of maximum seismic response for vibration control steel frames with scaling-frame device installed

**Akinobu Kano**[1], **Hideaki Azu**[1], **Takumi Ito**[1],**Donghung Wu**[2], **Takashi Nagumo**[3] and **Haruhiko Hirata**[3]
[1]Tokyo University of Science, Japan
[2]Wu Office, Japan
[3]Hory Corporation, Japan

The innovated vibration control device called as scaling frame "SF" structure has been proposed by the authors, and the SF structures are applied to low-rise wooden structures already. This paper aims to investigate the applicability of SF structure on steel frames. Herein, SF structure consists of beam-column frame, diagonal bracing and SF device installed. SF device is made of Steel or aluminum. Vibration energy is absorbed by the plastic behavior of the diagonal deformation of SF device. In previous study, the experimental study on SF device and steel frame specimen, with SF installed, were conducted to clarify the seismic response and seismic mitigation effect. Analytical method has been suggested from observation of test results. By comparing the test results, the proposed method shows good agreement with the test results. Furthermore, the enormous past studies have suggested prediction method of maximum seismic response of vibration control frames. This study aims to develop the prediction method of seismic response on vibration controlled steel frames with SF installed, and the simple design procedure is provided. The simplified restoring force characteristics which can chase the test results was applied on prediction method procedure. The prediction method was reformulated to adapt the bilinear model and strain hardening rule. The time history response analysis was performed to investigate the applicability and effectiveness. From the comparison and analysis of results and predictions, it is confirmed that the proposed prediction method shows enough accuracy.

## Biography

Akinobu Kano has completed his Bachelor's degree from Tokyo University of Science, Tokyo Japan, in 2016. He is now a Master's course student at Tokyo University of Science.

aktennis1214@gmail.com

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