


Requests for Collaboration

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<p>Research Interests</p>	
<ul style="list-style-type: none"> ● Vibration control of spatial structures ● Mechanical characteristics of shell and spatial structures ● Seismic performance of suspended ceiling for large span structures 	
<p style="text-align: center;">Creative Achievements in The Application of New and Existing Science and Technology</p>	
<p>(1) A number of TMDs have been already installed in tall buildings, bridges, towers for response control against primarily wind-induced external loads. On the other hand, it appears that TMDs have not been installed in real spatial structures. As the reason for that the following two vibration properties of spatial structures could be pointed out: (a) Various vibration modes involving rather high modes, (b) Closely spaced natural frequencies of those vibration modes. Then, I propose a spatially distributed MTMD (Multiple TMD) method to control plural vibration modes with closely spaced natural frequencies effectively.</p> <p>(2) TMDs show superior control performance for harmonic responses, but have limited capacity for transient responses. To control transient responses effectively, I propose TMDs with initial displacement. This device is based on the principle that, under a specific structural initial condition, by giving specific initial displacement to a TMD, the low damping mode is eliminated while the modal response with high modal damping is only oscillated.</p> <p>(3) I propose novel suspended ceiling by using diagonal cables instead of braces. I study vibration characteristics subjected to seismic loads and propose optimal cable arrangement.</p>	
<p style="text-align: center;">Technology (Product, Process, Device, Service etc.) That I Want to Request for Collaboration</p>	
<ul style="list-style-type: none"> ● Vibration control system for spatial structures ● Vibration control devices applicable to large space structures (MTMDs, TMDs with initial displacement) ● Novel suspended ceiling by using diagonal cables 	
<p style="text-align: center;">A List of 5 Key Publications</p>	
<ul style="list-style-type: none"> • Settings of Tuning Ratios of Tuned Mass Dampers with Initial Displacement, <u>Susumu YOSHINAKA</u>, Keita KOZURU and Yoshiya TANIGUCHI, <i>Journal of Structural and Construction Engineering</i>, AIJ, No. 738, pp. 1177-1187, (2017) (in Japanese) • Formulation of release conditions for TMDs with initial displacement and its application to an arch model, <u>Susumu YOSHINAKA</u>, Riki YOSHIDA and Yoshiya TANIGUCHI, <i>Proceedings of the IASS Annual Symposium 2016</i>, “Spatial Structures in the 21st Century”, 26–30 September, 2016, Tokyo, ID 1024, pp.1-10, (2016) • Impact Testing of an Arch Model Using Tuned Mass Dampers with Initial Displacement, <u>Susumu YOSHINAKA</u>, Yoshiya TANIGUCHI and Makoto YAMAKAWA, <i>Journal of Structural and Construction Engineering</i>, AIJ, No. 722, pp. 735-745, (2016) (in Japanese) • A Study on Conditions to Release Initial Displacement for Tuned Mass Dampers with Initial Displacement, <u>Susumu YOSHINAKA</u> and Yoshiya TANIGUCHI, <i>Journal of Structural and Construction Engineering</i>, AIJ, No. 703, pp. 1247-1257, (2014) (in Japanese) • Vibration Control of Large Span Structures Using Spatially Distributed MTMDs, Division of MTMDs and its effect of vibration control, <u>Susumu YOSHINAKA</u> and Ken’ichi KAWAGUCHI, <i>Journal of Structural and Construction Engineering</i>, AIJ, No. 631, pp. 1551-1559, (2008) (in Japanese) 	