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Author Jiang Tzung-Lin Fan
Author's Email Address No Public.
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Abstract
This thesis uses a kinetic analysis model of a six axial stroke bear vibration force table system and the theory of structural model to stimulate excitation effects and impacts by experiment. We construct a 1:10 structure model house, which is a three floor or four floor aluminum structure with sizes being 40 cm (length)× 40 cm (width)× 90 cm (3 floor)or× 120 cm (4 floor). The mass is about 170 kg. Pillars and shear building wall are made of alloy spring fabrication; aluminum sheets are used to simulate floors.

To emulate an apartment building, or a commercial building with compartments dismantled, a 回 type three-floor building or a four-floor building separated by a center pathway is used. We simulate the building motion condition on the six-axis oscillation control simulator. Experiments on horizontal wave, vertical wave and vertical earthquake loads were carried out to test the impacts made by disturbing inertia and damping to the spectrum. From the mutual vibration response due to vertical earthquake force and the lateral displacement resulted from horizontal earthquake force, we can clearly observe if resonance occurs in the dynamical spectrum response of the 3-dimentional building model.

This work examines the dynamics of model building structures in a oscillation control simulator. We employed transformations to design schematic circuit simulator, conducted various experiments and recorded data by using sensors. Researches were also carried out in the construction of circuit models via electro-mechanical analogy. Verification through eigenvalue analysis and actual experiment data shows that such analogy accurately predicts the dynamics of buildings.
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