A Parameter Study of Coupling Properties in Finite Element Models of Single-Stud Double-Plate Panels

Dickow, Kristoffer Ahrens; Domadiya, Parthkumar Gandalal; Andersen, Lars Vabbersgaard; Kirkegaard, Poul Henning

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Tue-P-1 Case study on a subjective description survey of Speech Privacy for the workers with concentrated work in the contemporary workplace of Japan

Kazuki Kano
Tokyo Institute of Technology, Japan

Co-author: Yasushi Shimizu

New office designs have been considered to fit a today's work style in a contemporary workplace. The relationship of speech privacy to their productivity, however, has not been identified so far. The investigation to describe a worker's subjective evaluation for the acoustical environment of a concentration space is performed in a contemporary workplace. The results show the better verbal tree network and preferable acoustical conditions are discussed on "speech privacy" for the concentration work. And their acoustical characteristics are discussed to describe better speech privacy.

Tue-P-2 A Parameter Study of Coupling Properties in Finite Element Models of Single-stud Double-plate Panels

Kristoffer Ahrens Dickow
Aalborg University, Denmark

Co-authors: Parthkumar Gandalal Domadiya, Lars Andersen, Poul Henning Kirkegaard

Lightweight building techniques are currently progressing fast and using such structures for multi-storey multi-family dwellings is becoming part of the industry standard. Partitions in lightweight buildings are often constructed as plates on frame structures made of either wood or steel. In any case the low frequency sound transmission is often an issue that needs attention. The present paper utilizes a finite element model of a single-stud double-plate panel structure to investigate how different couplings between the plates and the frame structure affect the direct sound transmission. Four different coupling configurations are considered: 1) All structural contact points are completely tied; 2) only nodes on the centre lines of the structure are tied; 3) a narrow strip of tied elements connect the frame to the plates; 4) evenly spaced discrete elements are tied. In all cases the interaction between non-tied elements is neglected. The investigations are performed as parameter studies focusing on the effect of change in the model. The finite element model utilizes solid continuum elements for the entire structure. The computations are carried out in frequency domain in the range below 500 Hz and the load acts as a diffuse field on one side of the panel. The obtained results indicate that in order to accurately model sound transmission through a double-plate panel structure, the choice of coupling is an important factor.

Tue-P-3 Semi-adaptive feedback active control of MRI noise

Michal Meller
Gdansk University of Technology, Poland

Co-authors: Hirofumi Tetsu, Yoshinobu Kajikawa, Maciej Niedzwiecki

A feedback controller is proposed for cancellation of magnetic resonance imaging (MRI) noise. The design of the controller takes into account specific features of the MRI noise signal. Simulation results show that a considerable rejection rate of the MRI noise can be obtained.

Tue-P-4 Robust Feedback Active Noise Control Using Linear Prediction Filter

Hiroyasu Kobayashi
Kansai University, Japan

Co-author: Yoshinobu Kajikawa

In this paper, we propose a robust feedback active noise control (ANC) system using a linear prediction filter. The proposed feedback ANC system can reduce narrowband noise while suppressing disturbance including wideband components. The wideband disturbance makes the conventional feedback ANC system unstable or divergent because it corrupts the input signal to the control filter. On the other hand, a linear prediction filter is utilized for the feedback ANC system to suppress the wideband disturbance in the proposed feedback ANC system. Some experimental results obtained using a digital signal processor (DSP) demonstrate that the proposed feedback ANC system is superior to a conventional feedback ANC system in terms of stability while maintaining the same noise reduction ability.