

عنوان مقاله:

Passive and active noise control of a propeller fan by Matlab simulation

محل انتشار:

دومین کنفرانس بین المللی آکوستیک و ارتعاشات (سال: 1391)

تعداد صفحات اصل مقاله: 8

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خلاصه مقاله:

In fact, there are two approaches to controlling acoustic noise: passive and active. The tradi-tional approach to acoustic noise control uses passive techniques such as enclosures, barriers, and silencers to attenuate the undesired noise. The problem of low-frequency tonal noise is inherent to industries that use machinery such as internal combustion engines, compressors, fans, blowers, power transformers and gearboxes. Depending up on the type of application and cost constraints, tonal noise transmission controls in a number of ways, such as by the in-stallation of reactive silencers, barriers, side branch elements and active noise control devic-es. This is an experimental study done by using the active and passive noise control method. Frequency noise band produces by a propeller fan, which will propagate in a Plexiglas duct, with the dimensions of 20 × 20 × 150 cm. The noise generates by digital signal processing; the anti-noise propagates along the duct to cancel the primary noise as a response of DSP. In this method, fan noise acquires via a microphone, and the anti-noise propagates with the same amplitude and the reverse phase at the primary noise path via a speaker cancels the original noise. Matlab simulation is used to processing signals and create anti-noise by means of data acquisition card (DAC). The conclusions present a noise reduction of 5 to 10 dB at the peak frequencies. With regard to the wide range of frequencies of different noise sources, to having optimized circumstances in the duct, microphone location on the duct body or even the distance of the speakers may be important in signal processing, noise sampling and anti-noise production. Using Helmholtz resonator is a suggestion to optimize the process of noise abatement in duct. The peak frequency of residual noise has been reduced 5 to 10 dB more than applied ANC to optimize noise abatement of produced noise by fan along the designed duct. The work described in this study is concerned with the attenuation of tonal noise trans-mission in ducts by using .ANC system and side branch resonators simultaneously

کلمات کلیدی:

Passive, Active noise control, Helmholtz resonator, Matlab simulation

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