

11. Application of Active Noise Control System to Noise Including Multiple Predominant Frequencies

Laura Kanazawa, Mitsuyoshi Takemoto, Masayoshi Izumo

The low frequency noise is difficult to reduce by conventional methods such as soundproof walls. So we developed a feedforward type active noise control system for reducing low frequency noise like engine noise. Since some engine noises of construction machineries sometimes have multiple predominant frequencies in low frequency region, the control method can be applied to the multiple predominant frequencies. We developed two types of control methods. One type is parallel-type and the other is tandem-type. Parallel-type has several band-pass-filters each for particular predominant frequency and it can control output signals as fast as rapidity of changing noise. It is applicable to rapidly changing sound pressure noise like engine sound from moving construction machinery such as truck agitator. The tandem-type has a band-pass-filter including several predominant frequencies and it can control output signal of predominant frequencies in wide range. It is applicable to widely changing frequency noise like engine sound from power generator. Through field experiments, the system we developed showed remarkable reduction effect of the engine noise from construction machinery, truck agitator and power generator, about 5 to 10 dB in 80 to 160 Hz of 1/3 octave band.

Key words: active noise control , feedforward, low frequency noise, construction machinery