

3aSP9. Wavefront control by wave number domain focusing. Joungh-Woo Choi, Ji-Ho Jang, and Yang-Hann Kim (Ctr. for Noise and Vib. Control, Dept. of Mech. Eng., KAIST, Sci. Town, Daejeon, 305-701, Korea, jwoo@kaist.edu)

This study introduces a novel method that can manipulate propagating direction of wavefronts within a selected region using source array. The idea of the proposed method stems from a method of acoustic contrast maximization, which has been used to focus sound energy within a zone of interest. This paper attempts to focus sound energy in the wave number domain, so that the sound energy of a selected region is concentrated on a desired wave number area. This makes it possible to generate a plane wave that propagates to a desired direction. The simple pure-tone case is considered to express the idea in the wave number domain; then, the method is extended to more general case, where an excitation signal has a broadband spectrum. Numerical and experimental results obtained in various conditions certainly validate that the direction of the wavefront can be manipulated for some finite region in space. [Work supported by the BK21 project initiated by Ministry of Education and Human Resources Development of Korea.]