

Abstract Submitted  
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**Near-field mapping of pressure fields during active noise control of small axial cooling fans** BENJAMIN SHAFER, COLE DUKE, KENT GEE, Brigham Young University — In the past, tonal noise from small axial fans has been globally reduced using active noise control (ANC) with near-field error sensors placed according to a theoretical condition of minimized radiated power [K.L. Gee and S.D. Sommerfeldt, *J. Acoust. Soc. Am.* **115**, 228-236 (2004)]. The theoretical model, based on mutual coupling of point sources, showed that pressure nulls exist in the near field when the total radiated power is minimized. Error sensor placement at these locations should then optimize global ANC. This study comprises an experimental investigation in which the actual locations of these near-field pressure nulls have been measured over a two-dimensional grid with a linear array of microphones. The array consists of 25 quarter-inch microphones with half-inch spacing. This array has been used to map the radiated pressure field from a 60mm cooling fan during ANC, in addition to a benchmark case, where a small loudspeaker has been mounted in place of the fan. The experimental results are compared to the theoretical pressure null locations in order to determine the efficacy of the point source theoretical model.

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