Near-⁻eld broadband beamformer optimal design K.F.C. Yiu^{* 1}, K.L. Teo¹, Nedelko Grbi^{® 2} and S. Nordholm ³

Abstract: Broadband microphone arrays have important applications such as handsfree mobile telephony, voice interface to personal computers and video conference equipment. The design problem can be tackled in di®erent ways. One method is to use a physical model to pose the design problem as a Chebyshev minimax problem. If a I₁-norm approximation or the real rotation approach is applied, the minimax design problem can be further reduced to a semi-in⁻nite linear programming problem. A numerical scheme using a set of adaptive grids is proposed. The design method is robust to source movement. The method can be applied to design multidimensional digital ⁻nite-impulse response (FIR) ⁻Iters with arbitrarily speci⁻ed amplitude and phase.

Another design method is to use sequences of calibration signals to achieve a speci⁻c performance. A method is proposed which can control and adjust speech distortion, noise suppression and echo cancellation easily. It turns out that signi⁻cantly shorter ⁻Iter length can be applied to achieve better overall performance than the least-squares method or the signal-to-noise plus interference method.

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