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Use of head mounted microphone arrays for active control

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There has been an effort recently to create head mounted or user worn microphone arrays. These arrays pose challenges in their design and characterization but can be used for a number of different purposes. Initially these arrays were intended for sound source localization and natural hearing restoration (where the hearing of a user whose ears are obstructed by an encapsulating helmet or headset is restored). Once in place, and assuming the user is wearing headphones, these arrays can be used for a number of different applications including voice isolation for communication, focused listening and noise cancellation. Specifically this paper investigates the use of these arrays for the active control of noise both at the user's ears and in the communications/voice signals sent from the user. A numerical study, using both data generated numerically and experimentally, demonstrates that large reductions in noise can be achieved using adaptive active control methods.