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Source detection and tracking in 3-D space using efficient subspace methods

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This presentation will demonstrate the versatility and robustness of a MUSIC-based subspace algorithm for acoustic source detection and tracking. The new algorithm (MUSIC3D) is designed for use with spherical arrays and performs three dimensional source detection and tracking. MUSIC3D operates on a spherical decomposition of the received array signals which results in its high efficiency. Spherical decomposition of the array signals allows for data reduction, frequency selection, and direct subspace calculations. The appeal of the MUSIC3D algorithm is that it offers a large variety of implementations which can be tailored for specific environments, signal sources or noise sources. Source tracking is accomplished through a combination of a Kalman-based filter and the MUSIC3D algorithm.