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Two uniform linear arrays for non-coherent and coherent sources for two dimensional source localization
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Abstract
This paper presents a novel method for the two-dimensional direction of arrival (DOA) estimation based on QR decomposition. A configuration with two uniform linear antenna arrays (ULAs) is employed for the joint estimation of elevation (θ) and azimuth (φ) angles. Q data matrix will estimate the azimuth angle while R data matrix will estimate the elevation angle. The proposed method utilizes only a single snapshot of the received data and constructs a Toeplitz data matrix. This reduces the computational complexity of the proposed method to O((N + 1)2) from O(N3) for SVD based methods. The structure of the data matrix also favors the 2D DOA estimation for both coherent and non-coherent source signals. Simulation results are presented, and performance of the proposed method is compared with the Matrix Pencil method for 2D DOA estimation of multiple incident source signals.

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