

Efficient Antenna Array Beamforming with Robustness against Random Steering Mismatch

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Abstract : This paper deals with the problem of using antenna sensors for adaptive beamforming in the presence of random steering mismatch. We present an efficient adaptive array beamformer with robustness to deal with the considered problem. The robustness of the proposed beamformer comes from the efficient designation of the steering vector. Using the received array data vector, we construct an appropriate correlation matrix associated with the received array data vector and a correlation matrix associated with signal sources. Then, the eigenvector associated with the largest eigenvalue of the constructed signal correlation matrix is designated as an appropriate estimate of the steering vector. Finally, the adaptive weight vector required for adaptive beamforming is obtained by using the estimated steering vector and the constructed correlation matrix of the array data vector. Simulation results confirm the effectiveness of the proposed method.

Keywords : adaptive beamforming, antenna array, linearly constrained minimum variance, robustness, steering vector

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