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MVDR beamformer model for array response vector mismatch reduction

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ABSTRACT: Beamforming algorithms attempt to extract a desired User-Of-Interest (UOI) from the background noise and interfering signals. The performance of the beamforming algorithm is evaluated based on various QoS criteria such as beampattern accuracy and Signal-to-Interference-plus-Noise-Ratio (SINR). In this paper, the null-forming constrain is added to the single linear constrain of Minimum Variance Distortionless Response (MVDR) to overcome the effect of finite snapshots problem and the array response vector imprecision. This constraint addition improves the null-forming at the User-Not-Of Interest (UNOI) direction. This work presents a new approach for extract the accurate array response vector. Numerical results show the robustness of the proposed approach to alleviating finite data snapshots effect. Moreover, this technique minimizes the sidelobe level, accurate beam shape to the UOI direction and pattern null in the UNOIs directions.