

## Blind Channel Estimation for Frequency Hopping System Using Subspace Based Method

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**Abstract:** Subspace channel estimation methods have been studied widely, where the subspace of the covariance matrix is decomposed to separate the signal subspace from noise subspace. The decomposition is normally done by using either the eigenvalue decomposition (EVD) or the singular value decomposition (SVD) of the auto-correlation matrix (ACM). However, the subspace decomposition process is computationally expensive. This paper considers the estimation of the multipath slow frequency hopping (FH) channel using noise space based method. In particular, an efficient method is proposed to estimate the multipath time delays by applying multiple signal classification (MUSIC) algorithm which is based on the null space extracted by the rank revealing LU (RRLU) factorization. As a result, precise information is provided by the RRLU about the numerical null space and the rank, (i.e., important tool in linear algebra). The simulation results demonstrate the effectiveness of the proposed novel method by approximately decreasing the computational complexity to the half as compared with RRQR methods keeping the same performance.