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Analysis of the modified multiple OLS (m^2OLS) algorithm for sparse signal recovery with noise. (Chinese. English summary) Zbl 07495009

Summary: Based on the multiple orthogonal least squares (mOLS), the modified mOLS (m^2OLS) has been proposed to recover the support of sparse signals $x$ from $y = Ax + v$. By using a pre-selected subset of columns of $A$, m^2OLS can realize computational simplicity over mOLS. In the framework of restricted isometry property (RIP), under three kinds of noise, we present some sufficient conditions on RIP and the minimum magnitude of the nonzero elements of the sparse coefficients, which can guarantee that m^2OLS identifies at least one index in the support of any sparse signal in each iteration in the noisy case. We also present a condition under which m^2OLS fails to recover the support of $x$ at the first iteration. Our results are better than the existing results.

MSC:
94A12 Signal theory (characterization, reconstruction, filtering, etc.)

Keywords:
compressed sensing; orthogonal least squares; restricted isometry property

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