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Ming-Jun Lai (mjlai@math.uga.edu), Department of Mathematics, University of Georgia, Athens, GA 30602, and **Jingyue Wang*** (jwang@math.uga.edu), Department of Mathematics, University of Georgia, Athens, GA 30602. *An Unconstrained ℓ_q Minimization with $0 < q \leq 1$ for Sparse Solution of Under-determined Linear Systems.*

We study an unconstrained version of the ℓ_q minimization for the sparse solution of under-determined linear systems for $0 < q \leq 1$. Although the minimization is nonconvex when $q < 1$, we introduce a regularization and develop an iterative algorithm. We show that the iterative algorithm converges and the iterative solutions converge to the sparse solution under some additional assumptions on under-determined linear systems. Numerical experiments are presented to demonstrate the effectiveness of our approach. (Received January 18, 2011)