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Akram Aldroubi and **Xuemei Chen*** (xuemei.chen@vanderbilt.edu), 2513A W. Linden Ave., Nashville, TN 37212, and **Alexander Powell**. *Compressed sensing: Perturbations of the Measurement Matrices and the Dictionaries.*

The compressed sensing problem for redundant dictionaries aims to use a small number of linear measurements to represent signals that are sparse with respect to a general dictionary. Under an appropriate restricted isometry property for a dictionary, reconstruction methods based on ℓ^q minimization are known to provide an effective signal recovery tool in this setting. This note explores conditions under which ℓ^q minimization is robust to measurement noise, and stable with respect to perturbations of the sensing matrix A and the dictionary D . We propose a new condition that guarantees that the ℓ^q minimization produces solutions that are robust and stable to perturbations of A and D and compressible signals – the D -null space property. We also show that ℓ^q minimization is jointly stable with respect to imprecise knowledge of the measurement matrix A and the dictionary D when A satisfies the restricted isometry property. (Received January 13, 2011)