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**Kangyu Ni, Somantika Datta\*** (somantikad@gmail.com), **Prasun Mahanti, Svetlana Roudenko** and **Douglas Cochran**. *Deterministic compressed sensing for efficient image reconstruction.*

The application of compressed sensing techniques for image reconstruction using deterministic sensing matrices will be discussed. Specifically, the sensing matrices used are constructed by either discrete chirps or second-order Reed-Muller sequences. Previous works by Applebaum et al. and Howard et al. used chirps and Reed-Muller sequences, respectively, for very sparse one-dimensional signals and their experimental results are quite good. The speed and accuracy suffer when the degree of sparsity is not high, making it inapplicable for natural and medical images. We propose efficient reconstruction algorithms for images with deterministic compressed sensing. The steps of the reconstruction algorithms include: initial best approximation, a greedy algorithm for the nonzero locations, and a new approach in the least squares method. (Received January 15, 2011)