1100-65-278 **Richard Baraniuk**, **Simon Foucart**, **Deanna Needell**, **Yaniv Plan** and **Mary Wootters*** (wootters@umich.edu). *Exponentially decaying error via adaptive quantization in one-bit compressed sensing.* Preliminary report.

In one-bit compressed sensing, one observes the signs of a few linear measurements of a sparse signal, and wishes to reconstruct the signal. It has recently been shown that in this setting, signal reconstruction is still quite feasible: to be precise, an s-sparse signal in $\mathbb{R}^n$ can be accurately reconstructed from $O(s\log(n/s))$ one-bit measurements. In this work, we focus on optimizing the decay of the error as a function of the *over-sampling factor* $\lambda := m/(s\log(n/s))$, where m is the number of measurements. It is known that the error in reconstructing the signal from standard one-bit measurements is at least $\Omega(\lambda^{-1})$. Without adjusting the way measurements are taken, there is no way to improve on this polynomial error decay rate. However, we show that by adaptively choosing the threshold used for quantization, one may improve the error to $e^{-O(\lambda)}$. This improves upon guarantees for other methods of adaptive thresholding as proposed in $\Sigma\Delta$ quantization. We give a simple recursive framework to achieve this exponential decay and a few specific polynomial-time methods based on linear programming and hard-thresholding which fall into this framework. (Received February 09, 2014)