1016-68-176 **Mark Rudelson*** (rudelson@math.missouri.edu), Dept. of Mathematics, University of Missouri, Columbia, MO 65211, and **Roman Vershynin**, Dept. of Mathematics, University of California, Davis, CA. *Sparse reconstruction from random Gaussian and Fourier measurements.*

Recently, there has been a series of advances in Sparse Approximation Theory, which have received the name of Compressed Sensing. One wishes to reconstruct a signal compressible in some basis from a small number of linear measurements. The number of measurements – the sample complexity of the problem – will be much smaller than the total number of basis coefficients of the signal. This problem was recently reduced to a Linear Programming problem. However, the best bound for the sample complexity is not known. We improve the best previous complexity bounds (number of measurements) for the LP reconstruction from random Gaussian and Fourier measurements. With high probability, one can exactly reconstruct any m-sparse function in $\mathbb{R}^d$ from the set of $12m\log(5m/d)$ Gaussian measurements. One can similarly reconstruct from $O(m\log^4(d))$ random Fourier frequencies. (Received February 11, 2006)