1098-90-26 **Robert J. Vanderbei*** (rvdb@princeton.edu), 209 Sherrerd Hall, Princeton University, Princeton, NJ 08544. *Two New Efficient Algorithms for Compressed Sensing Problems.*

We present two new approaches for efficiently solving large-scale compressed sensing problems. These two ideas are independent of each other and can therefore be used either separately or together. We consider all possibilities.

For the first approach, if the underlying signal is very sparse, some variants of the simplex method can be expected to take only a small number of pivots to arrive at a solution. We implemented one such variant and demonstrate a dramatic improvement in computation time on very sparse signals.

The second approach requires a redesigned sensing mechanism in which the vector signal is stacked into a matrix. The matrix variant, modeled correctly, is a much sparser linear optimization problem. Hence, algorithms that benefit from sparse problem representation, such as interior-point methods, can solve matrix sensing problems much faster than the corresponding vector problem. In our numerical studies, we demonstrate a ten-fold improvement in the computation time. (Received November 30, 2013)