1096-94-2769 **David L. Donoho*** (`donoho@stat.stanford.edu`). *Optimal Shrinkage of Singular values and Eigenvalues*

We consider recovery of low-rank matrices from noisy data using shrinkage of the data singular values. In an asymptotic framework, where the matrix size is large compared to the signal matrix rank, we show that for each of several popular loss functions, there corresponds a unique asymptotically admissible singular value shrinkage rule, which is a simple scalar nonlinearity. This generalizes results of Shabalin and Nobel (2010). Analogously, we consider estimation of the underlying near-white population covariance from sample covariance using shrinkage of the sample principal components. We assume that the population covariance matrix follows the popular Spiked Covariance Model (Johnstone 2001) and show that for many matrix loss functions used to evaluate performance of covariance estimation, there corresponds a unique asymptotically admissible eigenvalue shrinkage rule, which is a simple scalar nonlinearity, applied individually to each eigenvalue. Joint Work with David Donoho and Iain Johnstone. (Received October 02, 2013)