

1098-45-234

Michael Horst* (michael.horst@asu.edu), **R A Renaut** (rosie.renaut@asu.edu) and **Yang Wang** (ywang@math.msu.edu). *Validity of down-sampling data for regularization parameter estimation when solving large scale ill-posed inverse problems.*

Many physical systems are modeled using solutions to integral inverse problems. These solutions are found using some form of regularization, which requires one to determine the best regularization parameter, but this can be computationally expensive for problems with large data sets. One method for finding the regularization parameter is the Generalized Discrepancy Principle (GDP). For an integral kernel which is square integrable the discrete Singular Value Decomposition for the discrete kernel reveals information about the continuous Singular Value Expansion (SVE). With this information, convergence of the GDP parameter estimate with increasing resolution can be obtained. Hence one can down-sample the data and use the GDP to find a regularization parameter that will solve the full-scale problem. (Received January 27, 2014)