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M. Zuhair Nashed (znashed@mail.ucf.edu), Department of Mathematics, University of Central Florida, Orlando, FL 32816, and **Qiyu Sun***, Department of Mathematics, University of Central Florida, Orlando, FL 32816. *Sampling and Reconstruction of Signals in Reproducing Kernel Subspaces*. Preliminary report.

In this talk, we consider sampling and reconstruction of signals in a reproducing kernel subspace of L^p , $1 \leq p \leq \infty$, associated with an idempotent integral operator whose kernel has certain off-diagonal decay and regularity. The space of p -integrable non-uniform splines and the shift-invariant spaces generated by finitely many localized functions are our model examples of such reproducing kernel subspaces of L^p . We show that a signal in such reproducing kernel subspaces can be reconstructed in a stable way from its samples taken on a relatively-separated set with sufficiently small gap. We also study the exponential convergence, consistency, and the asymptotic pointwise error estimate of the iterative approximation-projection algorithm and the iterative frame algorithm for reconstructing a signal in those reproducing kernel spaces from its samples with sufficiently small gap. (Received September 08, 2009)