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*Total Positivity and Near-Optimal Sampling Inequalities*

A fundamental question in dynamical sampling is how many observations are needed for the stable recovery of a vector from its evolution under a linear operator. We investigate this problem for positive operators, highlighting the relation between the number of necessary observations and the spectrum of the operator.

Our main tool is a uniform interpolation theorem for translates of certain totally positive functions. We show that, given any uniformly separated sequence of centers, interpolation nodes can be chosen nearby so that the corresponding interpolation operator is boundedly invertible, with bounds depending only on the kernel and the minimum separation. Applying this result to operator orbits, we construct weighted Riesz bases with sampling counts attaining the natural spectral lower bound up to a bounded additive error.

The talk is based on joint work with Jian Wu.