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Signal/noise optimization strategies for stochastically estimated correlation functions

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Numerical studies of quantum theories usually rely upon an accurate determination of stochastically estimated correlation functions in order to extract information about the spectrum of the theory and matrix elements of operators. The reliable determination of such correlators is often hampered by an exponential degradation of signal/noise at late time separations. I will demonstrate that it is sometimes possible to achieve significant enhancements of signal/noise by appropriately optimizing correlators with respect to the source and sink interpolating operators. The ideas will be demonstrated for both a toy model, and single hadron correlators in QCD.

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