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F8: Algebraic Spectroscopy of Frequency Space Correlation Functions

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Lattice Field Theory correlation functions are usually difficult to model in momentum space. As a result, fitting to a sum of poles in frequency space can be preferable especially when the signal contains an additive constant as this constant is isolated in the zero-frequency mode. To help model the spectroscopy in frequency space, we implemented a black-box method that we call rational approximation, in which we parameterize the function into an over-constrained matrix equation and represent it as a sum of a finite number of poles parametrized by pole energies and their corresponding residues. Using linear least squares, chi-square tests, and information criteria to find optimal fits, we present results for example correlation function data.

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