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Fast evaluation of multi-hadron correlation functions

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In recent work, it has been shown that contractions for multi-nucleon systems can be cast in terms of weighted sums of determinants of matrices constructed from quark propagators. For typical correlation functions even for few nucleon systems, the number of such determinants can be very large depending on the complexity of the interpolating fields that are used. We investigate efficient methods for determinant calculations making use of rank-one (and higher-rank) substitutions. Results will be presented that show that these methods provide very significant speedups in calculations of contractions for multi-hadron systems over calculations based on LAPACK routines.

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