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Importance of closed quark loops for lattice QCD studies of tetraquarks

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To investigate the light scalar tetraquark candidate $a_0(980)$ (quantum numbers $J^P = 0^+$), a correlation matrix including a variety of two- and four-quark interpolating operators has to be computed. We discuss efficient techniques to compute the elements of this correlation matrix. In particular we present numerical results for diagrams with closed quark loops and present evidence that such diagrams are not negligible, i.e. that their contribution is essential to obtain physically meaningful results.

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