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Exotic states and their properties in large- N_c QCD

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Discussing four-point Green functions of bilinear quark currents in large- N_c QCD, we formulate rigorous criteria for selecting diagrams appropriate for the analysis of potential tetraquark poles. We find that both flavor-exotic and cryptoexotic (i.e., flavor-nonexotic) tetraquarks, if such poles exist, have a width of order $O(1/N_c^2)$, so they are parametrically narrower compared to the ordinary qq mesons, which have a width of order $O(1/N_c)$. Moreover, for flavor-exotic states, the consistency of the large- N_c behavior of “direct” and “recombination” Green functions requires two narrow flavor-exotic states, each coupling dominantly to one specific meson-meson channel.

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