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Calculating the chiral condensate diagrammatically at strong coupling

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We develop a diagrammatic approach for calculating the chiral condensate on the lattice at strong coupling for QCD and related theories with fermions in the symmetric, antisymmetric, and adjoint representations. The approach is inspired by recent work of Tomboulis and earlier work in which the chiral condensate is obtained diagrammatically in the limit of infinite coupling. We calculate the chiral condensate in this limit as a function of the number of colours and fermion flavours and discuss convergence of the approach and sources of error.

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