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Momentum dependence of the topological susceptibility with overlap fermions

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We investigate the momentum dependence of the topological susceptibility and its derivative at zero momentum with overlap fermions.

We expose the role of the low-lying Dirac eigenmodes for the topological charge density, and find a negative value for the derivative. While the sign of the derivative is consistent with the QCD sum rule in pure Yang-Mills theory, the absolute value is estimated larger if only the contribution from the zero modes and of the low-lying eigenmodes is taken into account. We also examine the effect of dynamical quarks by a reweighting method and find that it reduces the topological susceptibility for smaller quark masses and triggers the change of sign of the derivative.

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talk

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