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Comparison of different lattice definitions of the topological charge

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We present a comparison of different definitions of the topological charge on the lattice, with 2 and 2+1+1 flavours of dynamical twisted mass fermions. We give detailed results at one lattice spacing and also show that the correlation between different definitions increases as one approaches the continuum limit. The investigated definitions are: index of the overlap Dirac operator, spectral projectors, fermionic from disconnected loops, spectral flow of the Hermitian Wilson-Dirac operator and field theoretic with different kinds of smoothing of gauge fields (HYP and APE smearings, gradient flow, cooling). We also show some results on the topological susceptibility.

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