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Discrete anomaly matching and high-T center vortices in QCD(adj)

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We study the recently discovered mixed discrete-chiral/center-symmetry (0-form/1-form) 't Hooft anomalies, which give new nontrivial consistency conditions that the IR dynamics of a strongly coupled QFT should obey. We use the simplest QFT example where such anomalies are present, the massless Schwinger model with charge- q fermions, to simply elucidate how they appear. We show that the anomalies show up as a central extension of the symmetry algebra and that they are matched in the IR by breaking of both the discrete chiral and center symmetries.

Further, we show that the charge-2 Schwinger model appears on the worldvolume of the high-T domain walls (a kind of center vortices) in QCD with adjoint Weyl fermions. Thus, there is a nonzero fermion condensate and a perimeter law for the Wilson loop on the domain walls. We discuss the multiflavor generalizations, the utility of the domain wall physics, possible lattice studies, and the theoretical questions that await better understanding.

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