Lattice 2023



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Symmetric mass generation in lattice gauge theory

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We present results from simulations of a spin(4) lattice gauge theory in four dimensions containing a single flavor of massless reduced staggered fermion. This model does not allow for single site gauge invariant bilinear fermion terms and instead we show that it develops a four fermion condensate in the confining regime. The absence of symmetry breaking is consistent with the cancellation of a 't Hooft anomaly corresponding to a discrete Z_4 symmetry. If the spin(4) symmetry is extended to SU(4) we argue that in the naive continuum limit the model contains the matter representations and global symmetries of the Pati-Salam GUT model in which we can embed a single family of the Standard Model

Topical area

Particle Physics Beyond the Standard Model

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