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Symmetric mass generation in lattice gauge theory

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We construct a four dimensional lattice gauge theory in which fermions acquire mass without breaking symmetries as a result of gauge interactions. We start from a $SU(2)$ lattice Yang-Mills theory with staggered fermions transforming under an additional global $SU(2)$ symmetry. The fermion representations are chosen so that single site bilinear mass terms vanish identically. A symmetric four fermion operator is however allowed and we show numerical results that show that a condensate of this operator develops in the vacuum. The spectrum of the theory contains a triplet of color singlet difermion states whose mass is given by the confinement scale Λ_s times a function of the dimensionless ratio $f(\lambda\Lambda_s)$.

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