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Fermion Mass Generation without a Chiral condensate[1]
VENKITESH AYYAR, SHAILESH CHANDRASEKHARAN, Duke Univ — While it is well known that massless fermions can become massive due to interactions, it is usually believed that this requires the formation of a fermion bilinear condensate that can act as the mass term for the fermions. Using a strong coupling argument within a lattice four-fermion model, we propose that, in principle, fermions may be able to acquire a mass without the formation of any such condensate. Using Monte Carlo calculations in three Euclidean space-time dimensions, we show evidence for this surprising possibility and argue that this massive strong coupling phase could also have an interesting continuum limit.

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