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The Thirring Model in 2+1d with Optimised Domain Wall Fermions

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We present results of a study of spontaneous symmetry breaking through fermion bilinear condensation in the single flavor Thirring Model in 2+1d. Domain Wall Fermions are used to capture the symmetry breaking pattern U(2)$\to$U(1)$\otimes$U(1) in the limit of domain wall separation $L_s \to \infty$, with the conserved fermion current coupled to a real vector auxiliary field defined throughout the bulk. The new feature is use of both hyperbolic tangent and Zolotarev Optimal Rational Function approximations to the signum function, which enhances L_s-convergence, together with the use of both Shamir and Wilson kernel functions for the corresponding overlap operator. The results yield compatible equations of state, consistent with the existence of a unique continuum limit at a strongly-coupled UV fixed point.

Topical area

Tests of Fundamental Symmetries

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