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Curved domain-wall fermions

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We consider fermion systems on a square lattice with a mass term having a curved domain-wall. It is shown that massless and chiral edge states appear on the wall. In the cases of S^1 and S^2 domain-walls embedded into flat cubic lattices, we find that these edge modes feel gravity through the induced Spin or Spin^c connections. The gravitational effect is encoded in the Dirac eigenvalue spectrum as a gap from zero. In the standard continuum extrapolation of the square lattice, we find a good agreement with the analytic prediction in the continuum theory. We also discuss how to couple the system to the gauge field and how to detect its nontrivial anomaly inflow between the bulk and edge.

Recording and publishing

yes

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