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Centre Vortex Effects on the Overlap Quark Propagator

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The fundamental aspects of the QCD vacuum that are responsible for the dynamical generation of mass through chiral symmetry breaking is an ongoing source of debate. We investigate the role of centre vortices in dynamical mass generation using overlap fermions. The exact chiral symmetry that the overlap fermion action possesses yields a distinctive response to the underlying topology of the gauge field, leading to novel results. We study the quark propagator and associated mass function on gauge- field backgrounds featuring the removal of centre vortices as well as on vortex-only backgrounds. The effect of cooling vortex-only backgrounds on the overlap quark propagator is also presented.

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