

Chiral gauge theories on a disk and a slab

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The Standard model as a chiral gauge theory is the core foundation of particle physics. Yet, no consensus has been reached on non-perturbative formulations of chiral gauge theories although a few number of promising theoretical models have been constructed. In this work, we exam the extra dimension or domain wall fermion approach. Firstly, we numerically tested the slab (Grabowska-Kaplan) proposal in 2+1 dimensional lattice with a background gauge field and showed anomaly inflow, anomaly cancellation, and the behaviour of the boundary chiral model under different flow of the gauge field. Secondly, we tested a recently proposed proposal with a disk shape defect with a boundary under annealing flow of the background gauge field. Similarly, we demonstrate the mechanism of anomaly inflow and anomaly cancellation.

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