

# Curved domain-wall fermion and its anomaly inflow

*Thursday, 8 December 2022 14:00 (20 minutes)*

We propose a lattice fermion formulation with a curved domain-wall mass term as a nonperturbative regularization of quantum field theory in a gravitational background. In KEK-TH 2021 last year, we reported that the edge-localized modes appear on the curved domain-wall in free fermion theory on a square lattice, and they feel gravity through the induced spin and spin-c connections. We continue the study adding nontrivial  $U(1)$  gauge field background to the  $S^1$  or  $S^2$  domain-wall fermion systems. We find a good consistency with continuum theory in the anomaly inflow described by the Atiyah-Patodi-Singer index. This talk is based on our paper <https://arxiv.org/abs/2203.03782> and some preliminary results.

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