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## A staggered U(1) gauge theory inspired by self-adjoint extensions

*Thursday, 3 August 2023 16:00 (20 minutes)*

Novel regularizations of lattice gauge theories can potentially enable faster classical or quantum simulation, but the landscape of available regularizations and their continuum limits is not fully understood. Our recent work adds a point to this landscape by introducing a generalization of U(1) lattice gauge theory obtained by applying a boundary condition in group space with a twist angle  $\Theta$ , motivated by a self-adjoint extension of the electric field operator. The “staggered” choice  $\Theta = \pi$  is of particular interest, as it preserves almost all of the original symmetries of the theory. In this talk, I will discuss a numerical study of the staggered theory in three dimensions, which demonstrates confinement, as in the ordinary  $\Theta = 0$  theory, and more exotic phenomena including spontaneous  $\mathbb{Z}_2$  symmetry breaking and fractionalization of the confining string.

### Topical area

Theoretical Developments

**Primary authors:** BANERJEE, Aditya (SINP); MARIANI, Alessandro (University of Bern); BANERJEE, Debasis; KANWAR, Gurtej (MIT); RINDLISBACHER, Tobias (University of Bern); WIESE, Uwe-Jens (University of Bern)

**Presenter:** KANWAR, Gurtej (MIT)

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