

## The mixed 0-form/1-form anomaly in Hilbert space: pouring new wine into old bottles

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We study four-dimensional gauge theories with arbitrary simple gauge group with 1-form global center symmetry and 0-form parity or discrete chiral symmetry. We canonically quantize on a three-torus in a fixed background field gauging the 1-form symmetry. We show that the mixed 't Hooft anomaly results in a central extension of the global-symmetry operator algebra. We determine this algebra in each case and show that the anomaly implies degeneracies in the spectrum of the Hamiltonian at any finite-size torus. We discuss the consistency of these constraints with both older and recent semiclassical calculations in  $SU(N)$  theories, with or without adjoint fermions, as well as with their conjectured infrared phases.

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