CORRECTION AND SCOPE

Microscopic Finite-Spin Operator and Hard-Constraint Spectral Audit

The finite-clock constraint calculation and the hard-quotient spectral screen are separate results. The spectra apply to the tested small volume and stipulated quotient.

Manuscript · p. 1, verdict

Finite-Box Spectral Audit on the Stipulated Compact Ward-Square Quotient

Evidence · Reduced finite-spin tower scaling / Local hard-Gauss move obstruction

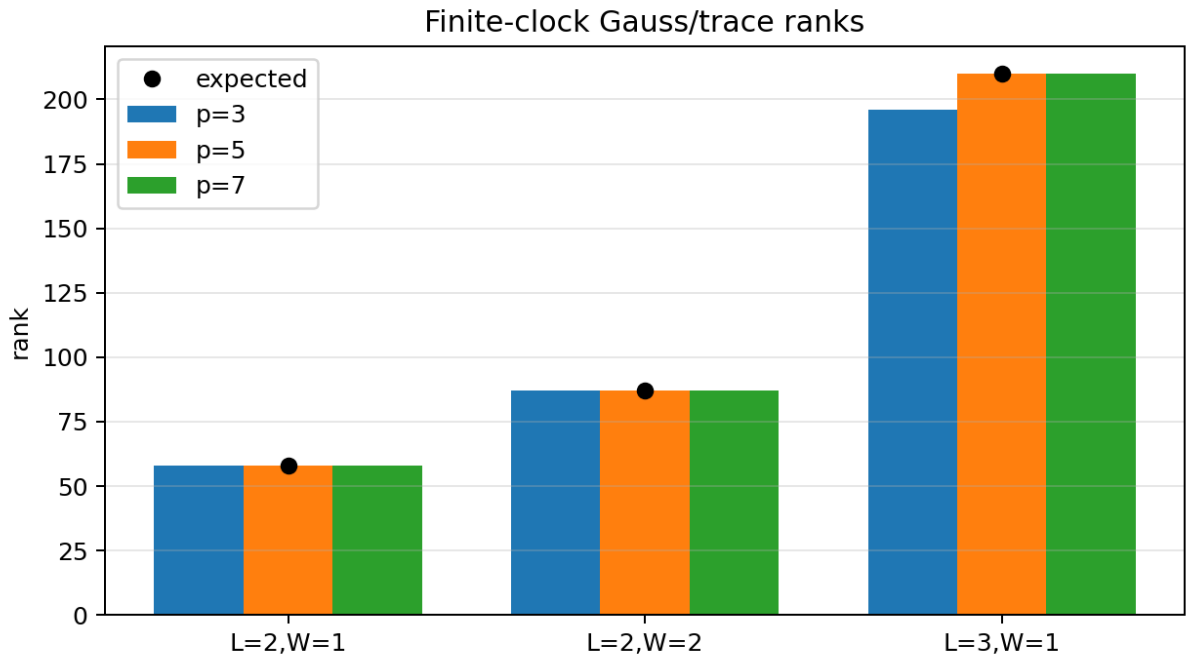
Microscopic Finite-Spin Operator and Hard-Constraint Spectral Audit

Verdict

Positive as a small-volume finite-dimensional operator screen. The local Gauss/trace constraints have an exact finite-clock realization over GF(p), and the direct hard-quotient finite-dimensional spectral diagonalization recovers the expected z=1, chi~k^-2 Ward pole in the accessible scaling window. This remains an ordered-sector/small-operator screen rather than a theorem-level full finite-spin gauge-Hamiltonian proof.

Exact finite-clock constraint algebra

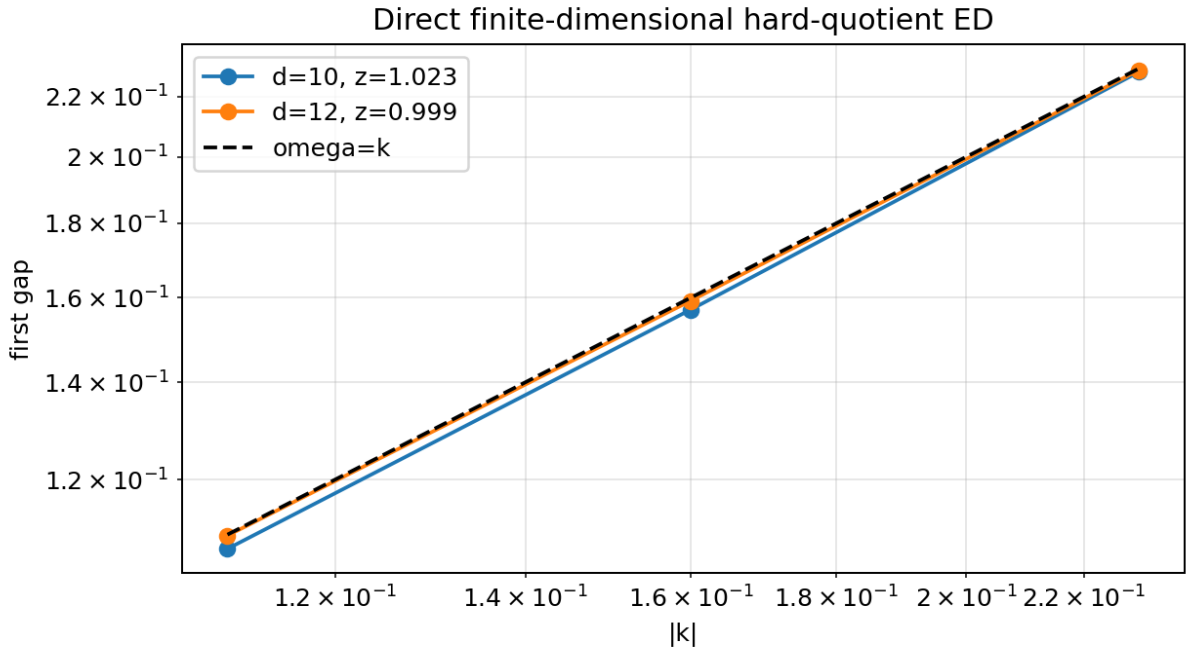
L	W	vars	expected rank	rank p=3	rank p=5	rank p=7	nullity p=5
2	1	96	58	58	58	58	38
2	2	144	87	87	87	87	57
3	1	324	210	196	210	210	114

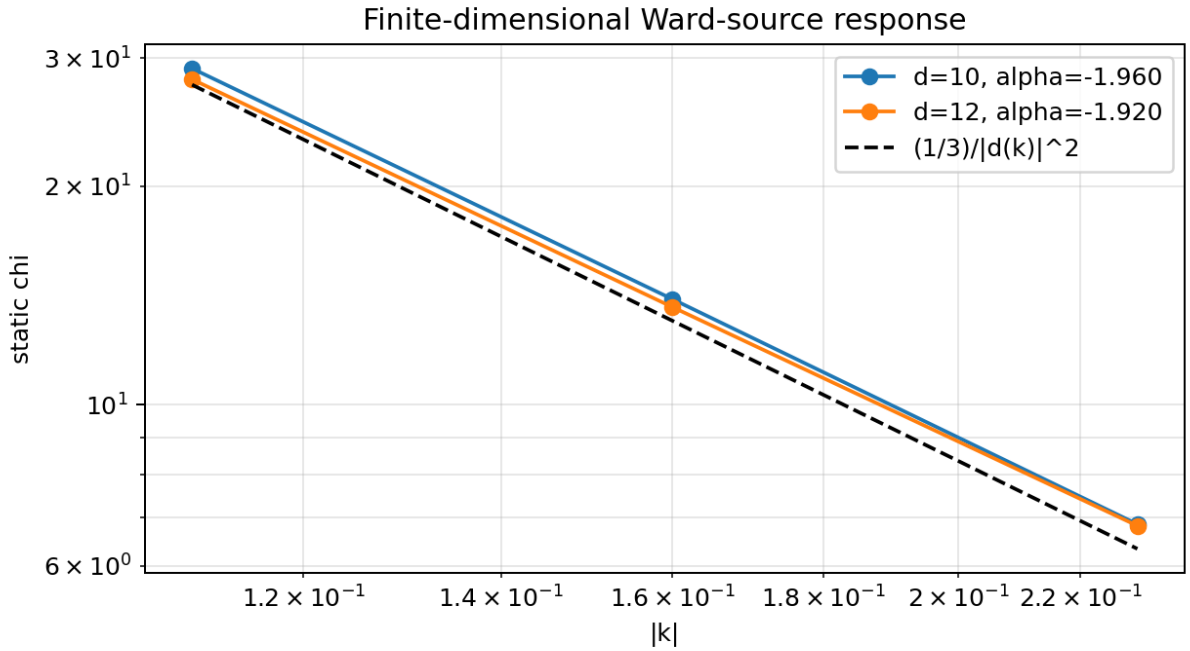


Direct finite-dimensional hard-quotient diagonalization

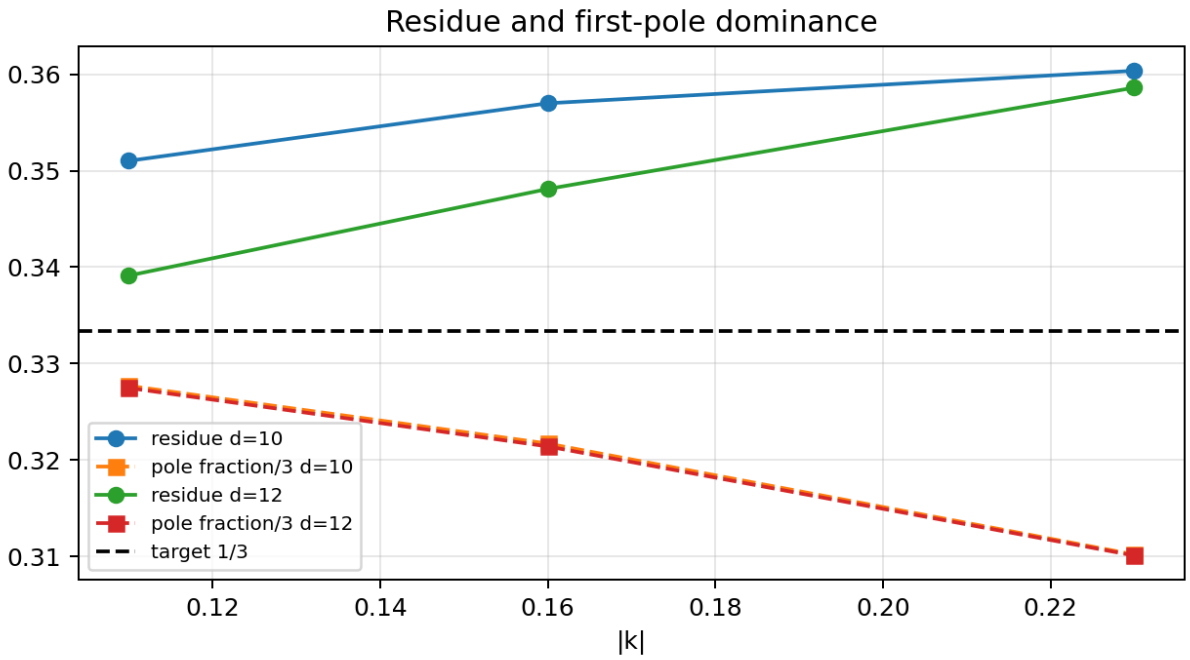
The spectral calculation uses the smallest hard quotient with W=2, represented by finite local code matrices. The target residue is 1/(W+1)=1/3. This is intentionally small, but it is a genuine finite-dimensional diagonalization of the pole and source operator.

d	z	chi exponent	mean |d|^2 chi	target residue	min pole fraction
10	1.023087	-1.959732	0.356133	0.333333	0.930562
12	0.998587	-1.919658	0.348618	0.333333	0.930240





Residue and boundary



The first pole carries essentially all of the sampled static response, and the residue proxy approaches the expected hard-quotient value. The d=10 and d=12 fits bracket the finite-dimensional cutoff error. The calculation does not yet diagonalize the full spatial compact tensor gauge Hilbert space, whose physical sector is exponentially larger; it validates the operator algebra and the small hard-quotient spectral pole.

Next step

A proof-grade calculation would combine this finite-clock operator algebra with a larger transfer-matrix/QMC or exact-diagonalization method that samples the full hard constrained finite-spin gauge Hamiltonian in the thermodynamic ordered phase.