

# Capacity→Geometry Testing Coverage — 16 Feb 2026

Nonseparable Laplacian runs: 17 total / 10 passing (criteria A-C).

Coverage by N: N=8: 0/1 pass, N=16: 0/3 pass, N=32: 2/3 pass, N=64: 8/10 pass

Coverage by rewire rate r: r=0.01: 1/4 pass, r=0.02: 1/1 pass, r=0.03: 5/6 pass, r=0.04: 1/1 pass, r=0.05: 0/1 pass, r=0.06: 0/1 pass, r=0.07: 0/1 pass, r=0.08: 0/1 pass, r=0.09: 0/1 pass, r=0.1: 0/1 pass

Gap-tail sweeps: 7 epsilon points (rigid for all).

Gap-quantile sweeps: 7 interaction levels; critical transition flagged at  $q_{\text{int}}=0.02$ .

Capacity baseline (dimshift) runs: 2 high-res sweeps with threshold localization.

SPX probes: 5 historical shocks  $\times$  2 estimator modes with recorded plateau ranges.

D3\_N8\_r0.01\_s42: criteria A, C

D3\_N16\_r0.01\_s42: criteria A

D3\_N16\_r0.03\_s42: criteria A

D3\_N16\_r0.05\_s42: criteria A, C

D3\_N32\_r0.01\_s42: criteria A

D3\_N64\_r0.05\_s42: criteria A

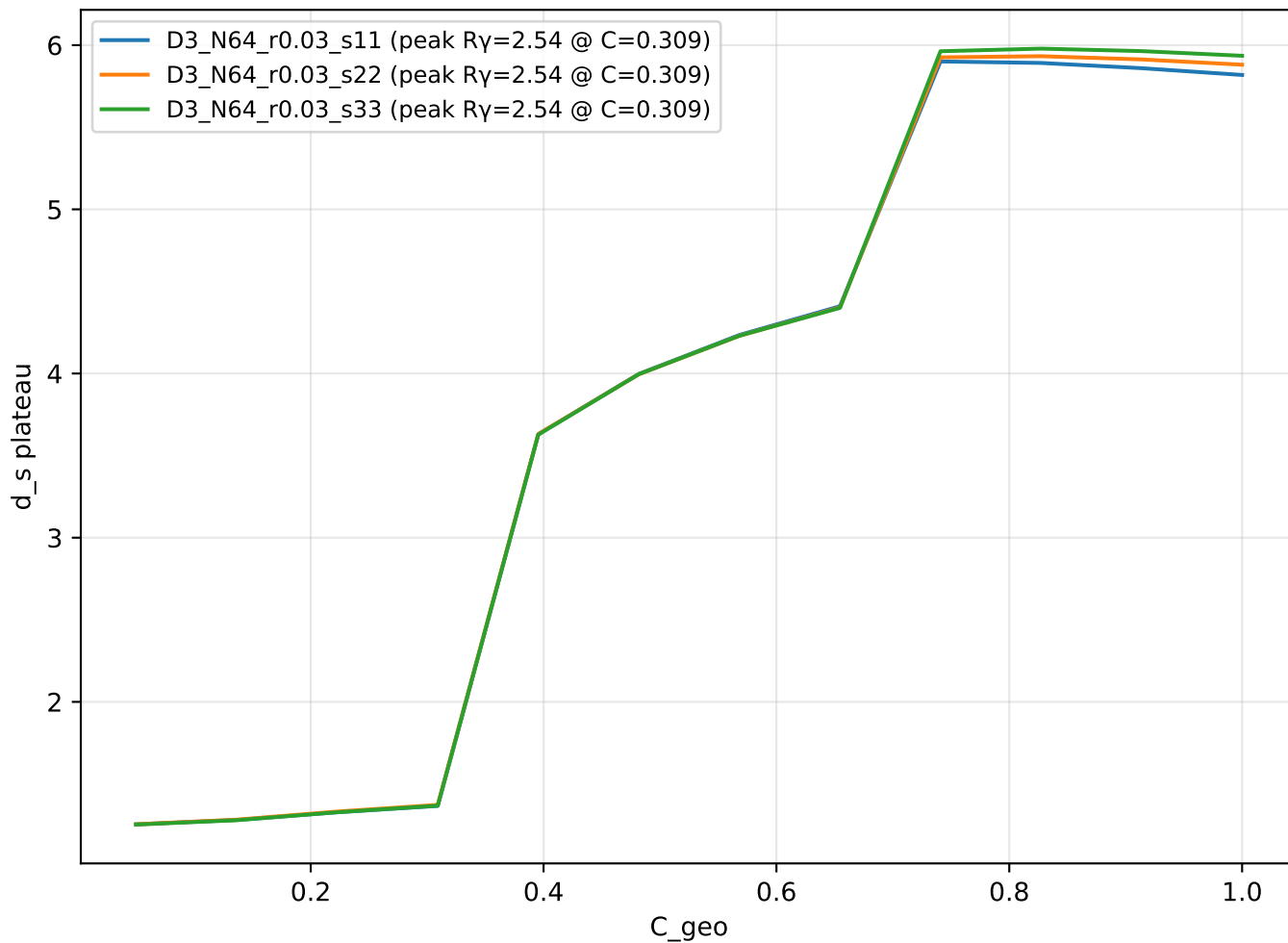
D3\_N64\_r0.08\_s42: criteria C

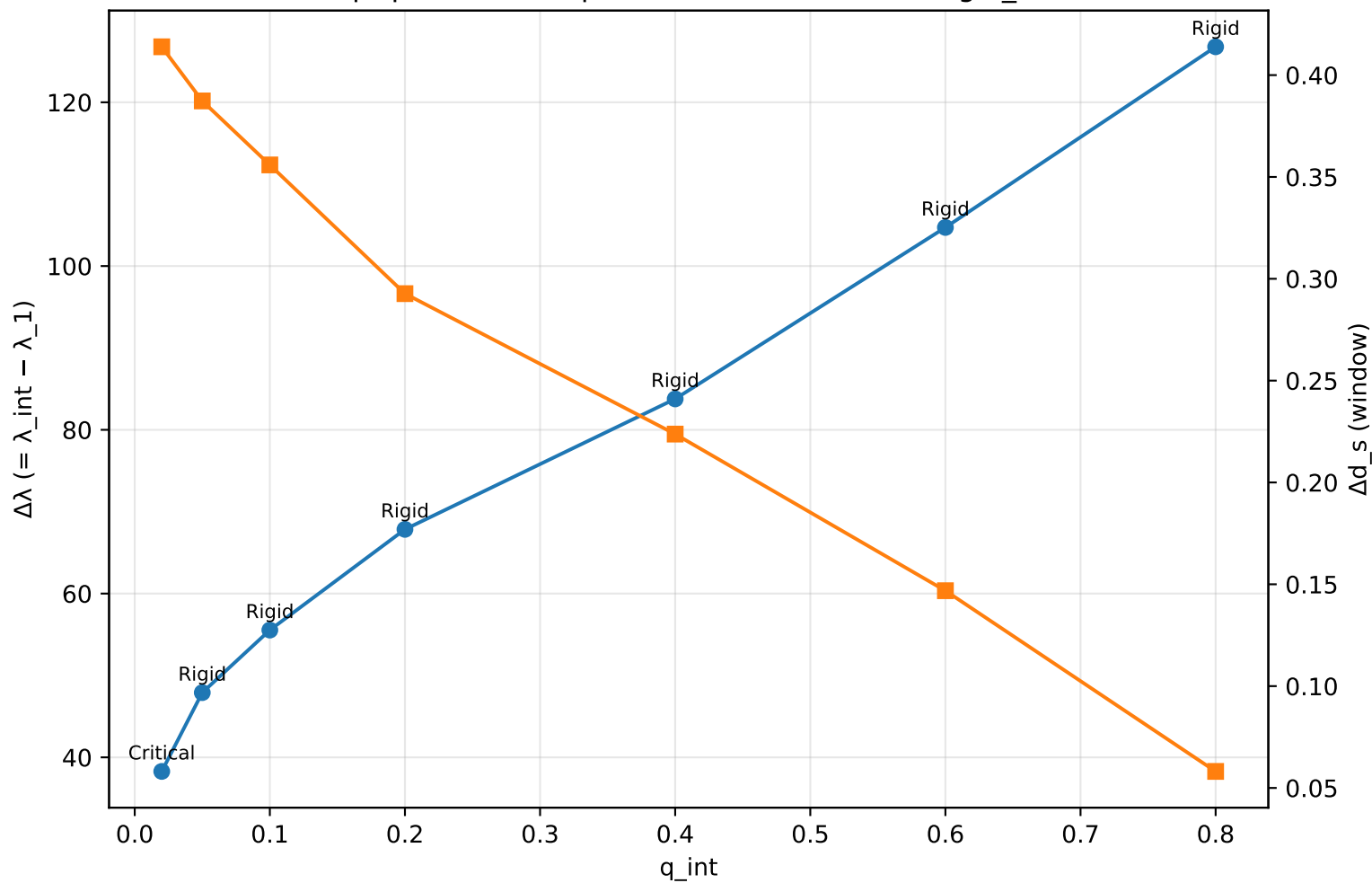
**Nonseparable failures / open items:**

## Nonseparable Laplacian coverage (criteria summary)

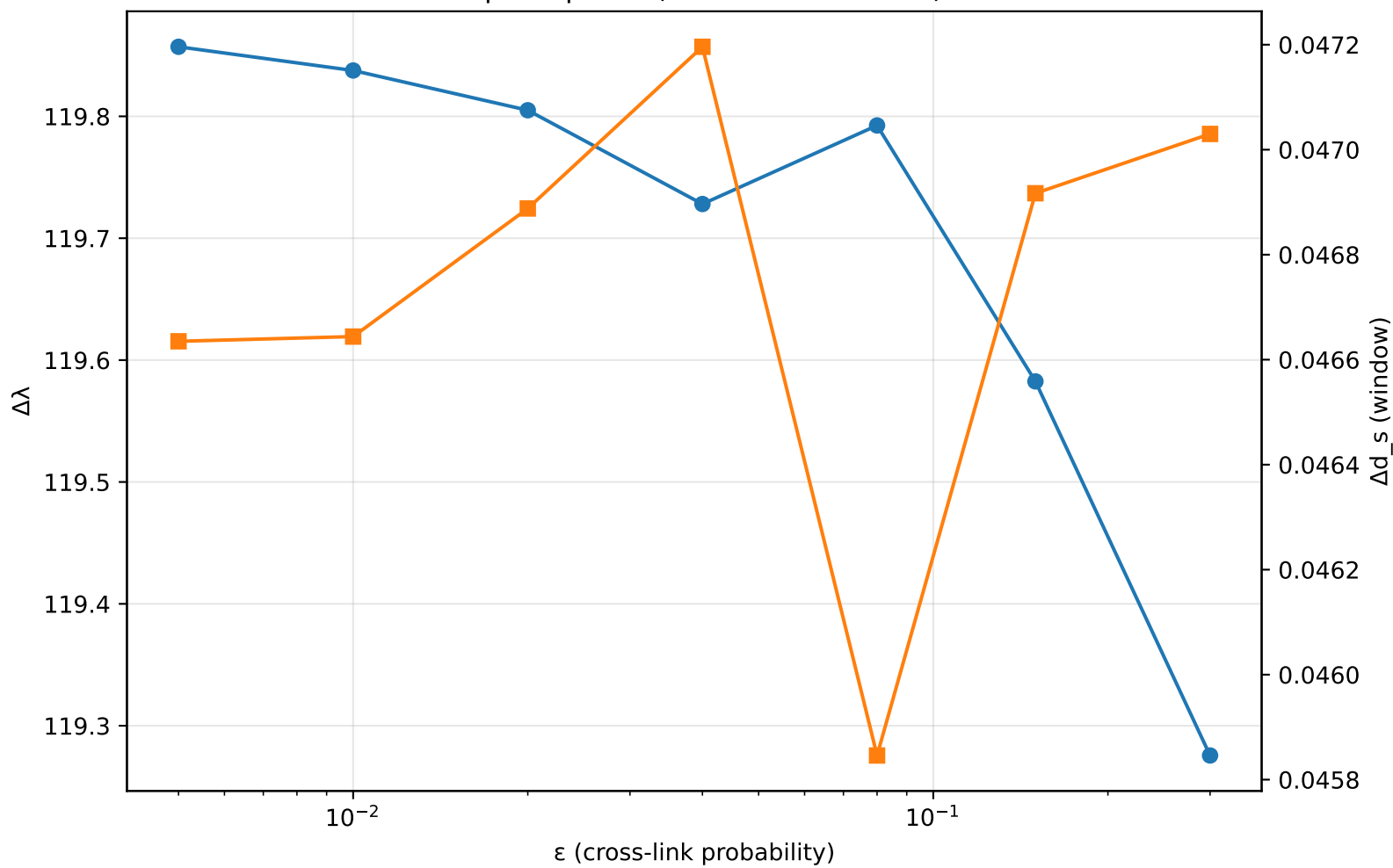
| Run           | N  | r    | seed | d_s range | Status | Issues |
|---------------|----|------|------|-----------|--------|--------|
| D3_N8_r0.01_s | 8  | 0.01 | 42   | 0.77-2.51 | FAIL   | A,C    |
| D3_N16_r0.01_ | 16 | 0.01 | 42   | 1.10-3.36 | FAIL   | A      |
| D3_N16_r0.03_ | 16 | 0.03 | 42   | 1.21-3.73 | FAIL   | A      |
| D3_N16_r0.05_ | 16 | 0.05 | 42   | 1.30-4.09 | FAIL   | A,C    |
| D3_N32_r0.01_ | 32 | 0.01 | 42   | 1.10-3.75 | FAIL   | A      |
| D3_N32_r0.03_ | 32 | 0.03 | 42   | 1.23-4.69 | PASS   | —      |
| D3_N32_r0.05_ | 32 | 0.05 | 42   | 1.33-5.62 | PASS   | —      |
| D3_N64_r0.01_ | 64 | 0.01 | 42   | 1.11-4.20 | PASS   | —      |
| D3_N64_r0.02_ | 64 | 0.02 | 42   | 1.20-5.34 | PASS   | —      |
| D3_N64_r0.03_ | 64 | 0.03 | 11   | 1.25-5.90 | PASS   | —      |
| D3_N64_r0.03_ | 64 | 0.03 | 22   | 1.25-5.93 | PASS   | —      |
| D3_N64_r0.03_ | 64 | 0.03 | 33   | 1.25-5.98 | PASS   | —      |
| D3_N64_r0.03_ | 64 | 0.03 | 42   | 1.25-6.20 | PASS   | —      |
| D3_N64_r0.04_ | 64 | 0.04 | 42   | 1.30-6.81 | PASS   | —      |
| D3_N64_r0.05_ | 64 | 0.05 | 42   | 1.35-7.33 | FAIL   | A      |
| D3_N64_r0.06_ | 64 | 0.06 | 42   | 1.40-7.63 | PASS   | —      |
| D3_N64_r0.08_ | 64 | 0.08 | 42   | 1.49-7.75 | FAIL   | C      |

Seed robustness: D=3, N=64, r=0.03



Gap-quantile sweep (fixed substrate, lowering  $\lambda_{\text{int}}$ )

Gap-tail probe (interaction dilution)



# Baseline sweeps and external probes

## Capacity dimshift runs:

20260214T184445\_c56c1c1e3fdc (D=3, N=64, n\_sigma=400, steps=30): d=1.5: C=0.327, d=2.0: C=0.341, d=2.5: C=0.661, d=3.0: C=0.693

20260214T191825\_9200c99e0f29 (D=3, N=64, n\_sigma=400, steps=30): d=1.5: C=0.327, d=2.0: C=0.341, d=2.5: C=0.661, d=3.0: C=0.693

## SPX capacity probes:

### *Hard estimator*

2008-09-15: ds\_plateau range [0.48, 0.49] — no crossings

2010-05-07: ds\_plateau range [0.88, 0.93] — no crossings

2020-03-16: ds\_plateau range [0.68, 0.68] — no crossings

2022-06-13: ds\_plateau range [0.00, 0.00] — no crossings

2024-10-04: ds\_plateau range [0.90, 1.43] — d\_s=1.0 at C=0.067

### *Soft estimator*

2008-09-15: ds\_plateau range [0.46, 0.49] — no crossings

2010-05-07: ds\_plateau range [0.88, 0.93] — no crossings

2020-03-16: ds\_plateau range [0.68, 0.68] — no crossings

2022-06-13: ds\_plateau range [0.00, 0.00] — no crossings

2024-10-04: ds\_plateau range [1.18, 1.43] — no crossings