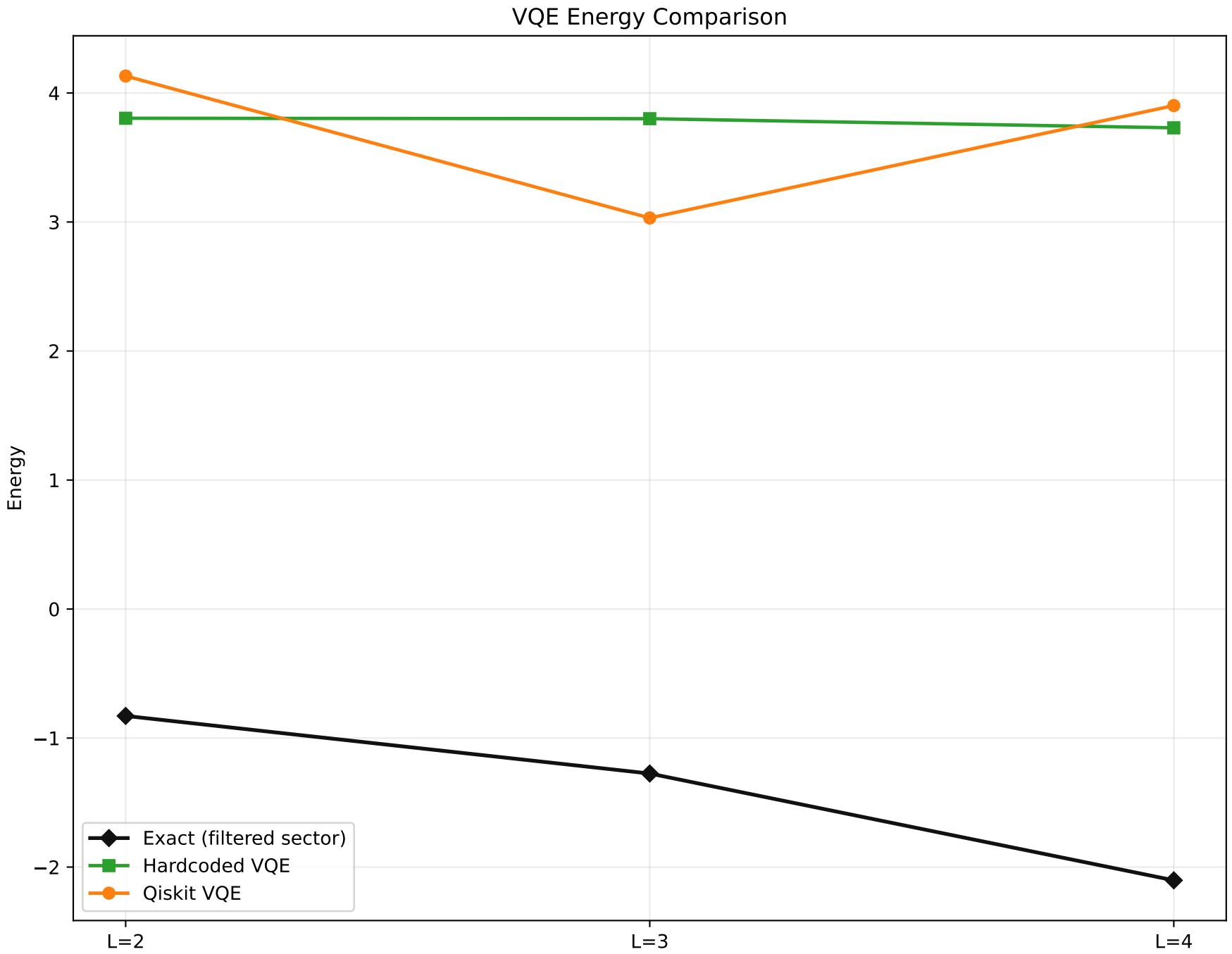
Hardcoded vs Qiskit Pipeline Comparison Summary

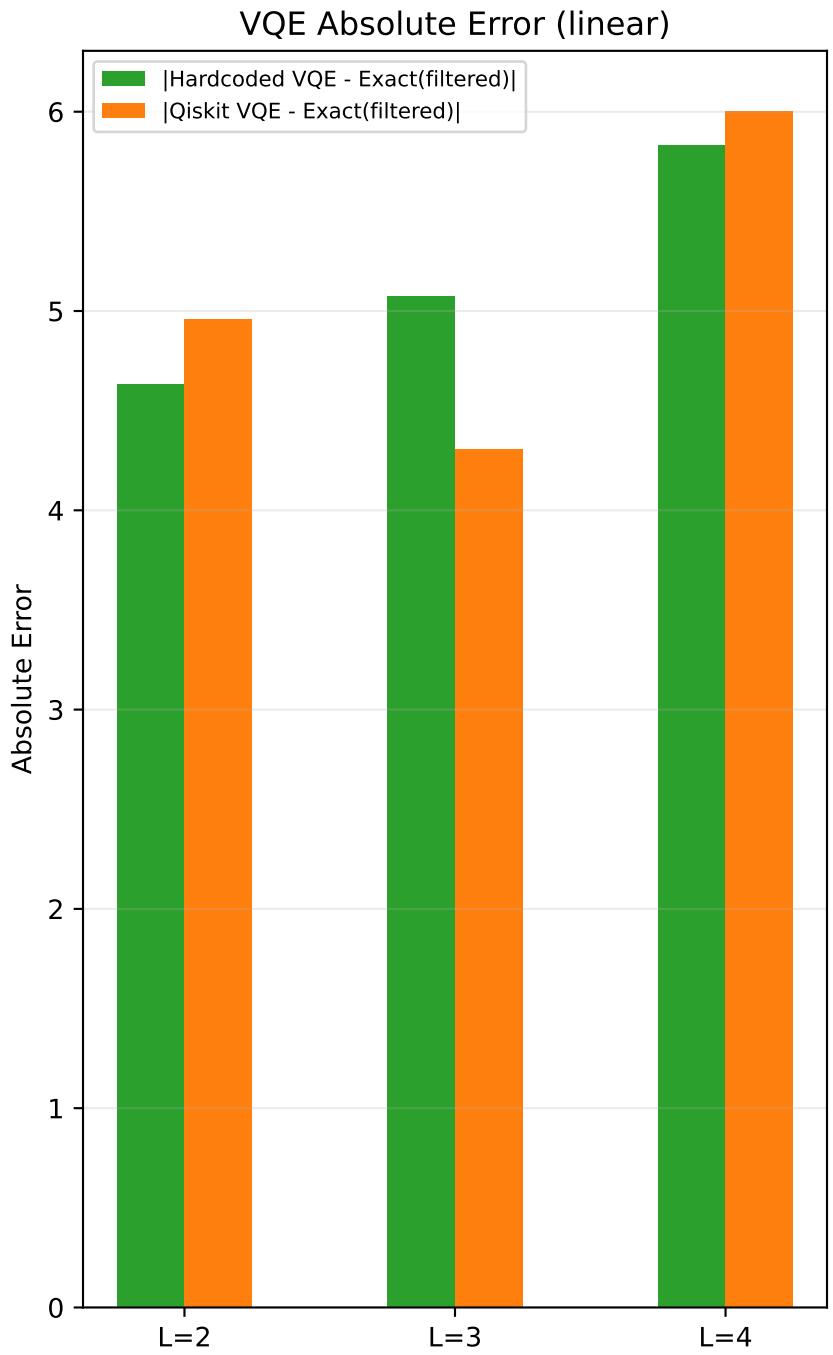
generated_utc: 2026-02-13T17:55:30.134554+00:00
all_pass: True
l_values: [2, 3, 4]
trajectory_comparison_basis: trotter trajectories start from each pipeline's selected initial_state_source (default: vqe)

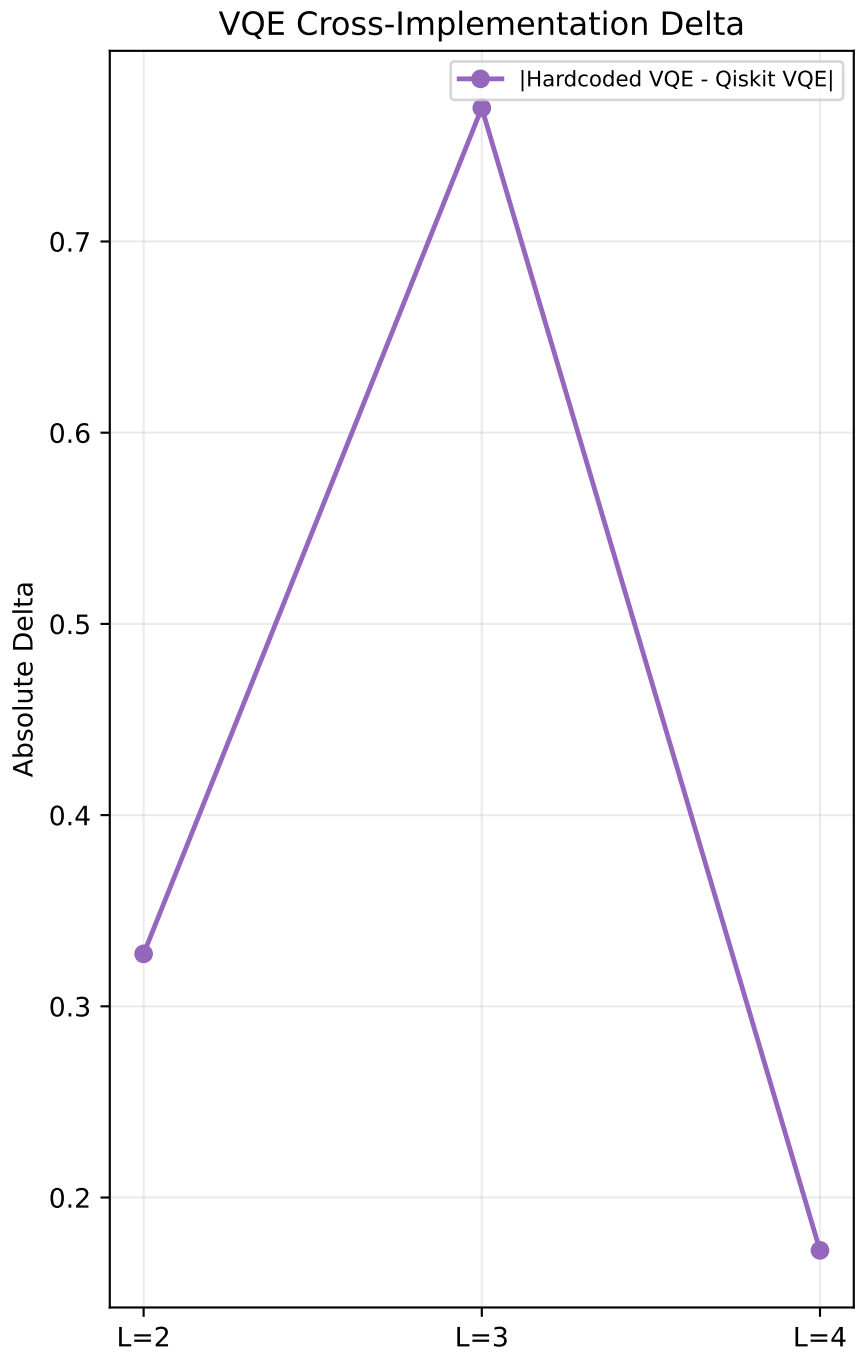
thresholds: {"ground_state_energy_abs_delta": 1e-08, "fidelity_max_abs_delta": 0.0001, "energy_trotter_max_abs_delta": 0.001,

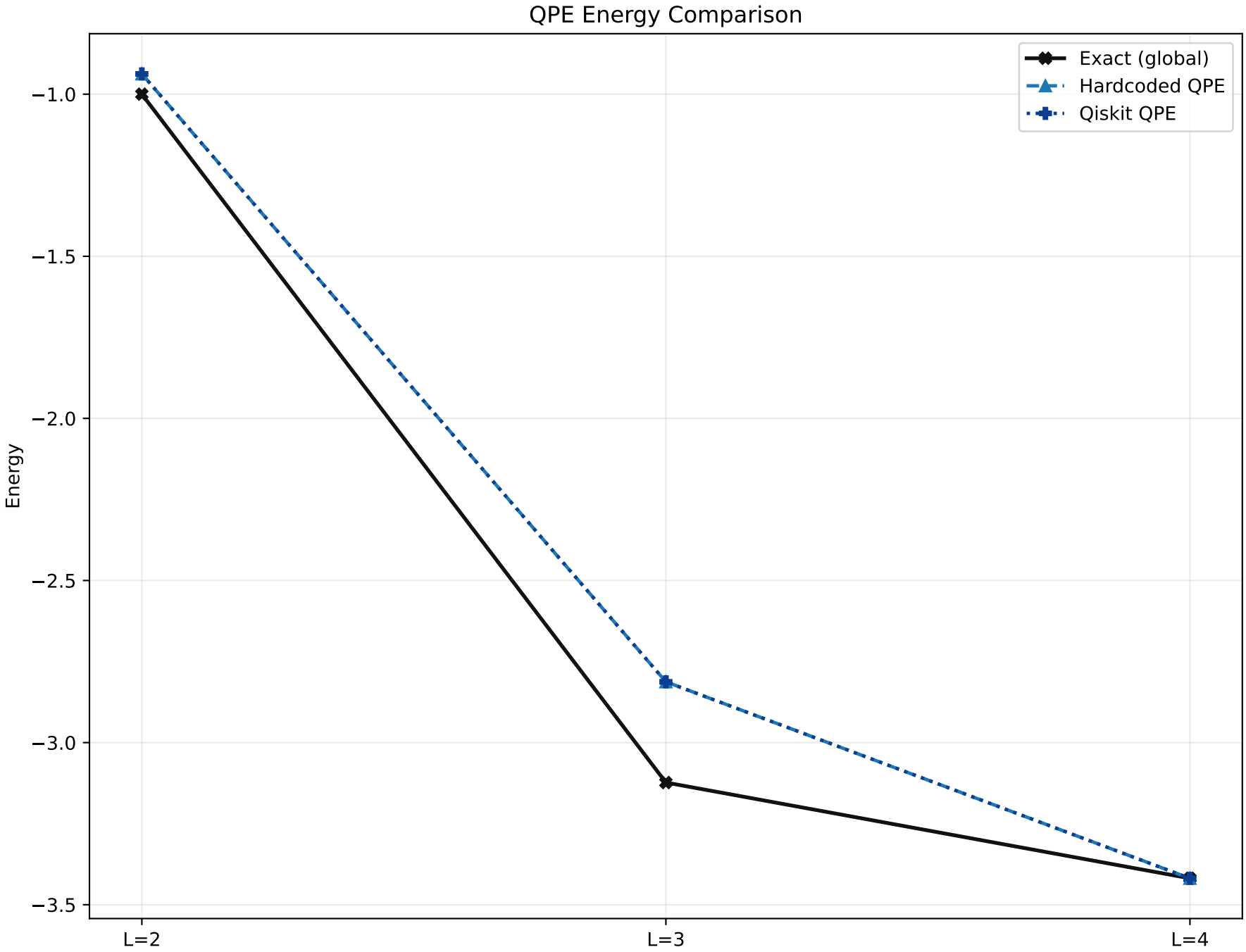
hardcoded_qiskit_import_isolation: {'pass': True, 'qpe_adapter_range': {'start_line': 299, 'end_line': 416}, 'qiskit_imports':

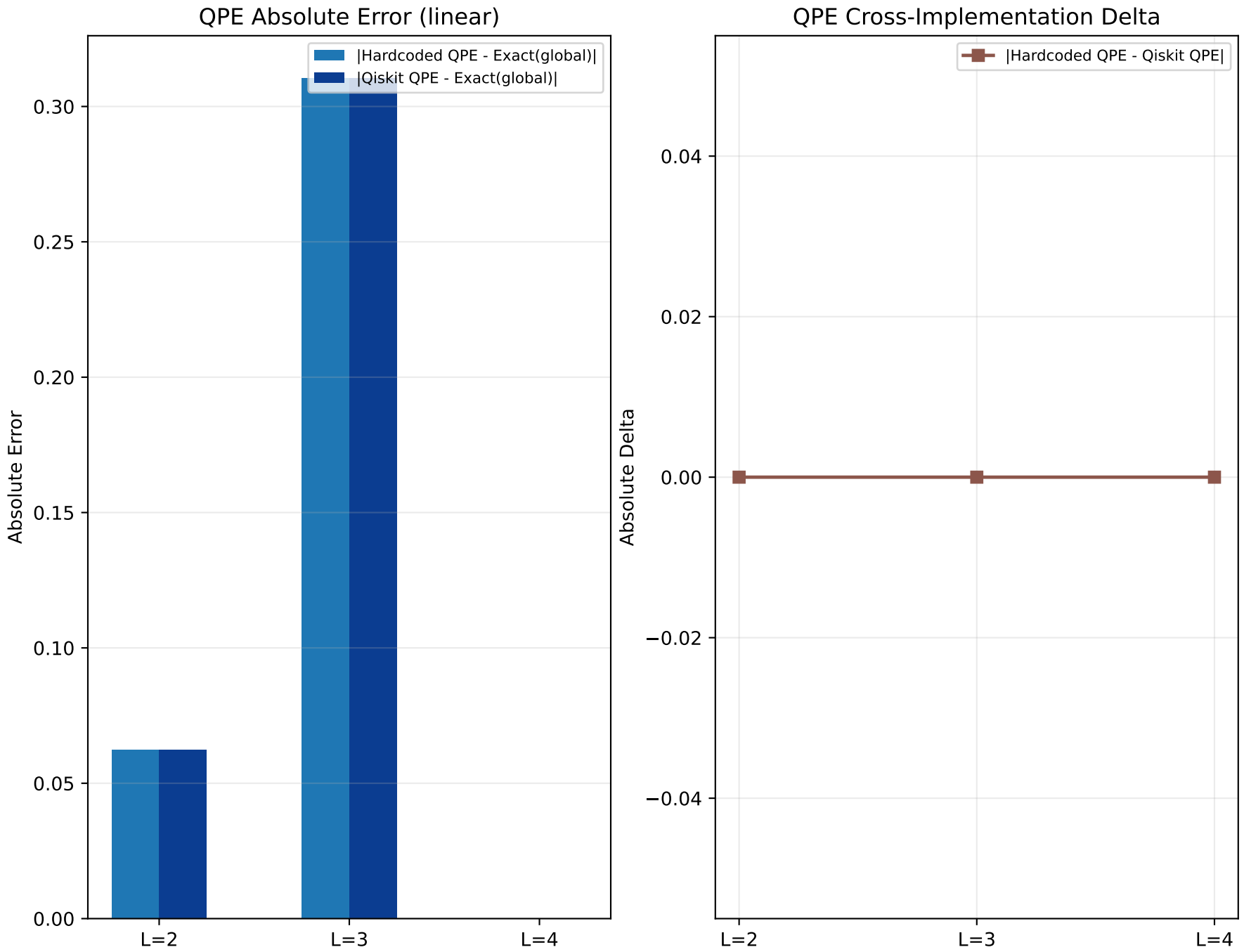
Per-L pass flags:
L=2 pass=True metrics_json=Tests/artifacts/hardcoded_vs_qiskit_pipeline_L2_metrics.json
L=3 pass=True metrics_json=Tests/artifacts/hardcoded_vs_qiskit_pipeline_L3_metrics.json
L=4 pass=True metrics_json=Tests/artifacts/hardcoded_vs_qiskit_pipeline_L4_metrics.json


VQE Energy Comparison
Energy
4
3
2
1
0
−1
−2
L=2
L=3
L=4
Exact (filtered sector)
Hardcoded VQE
Qiskit VQE

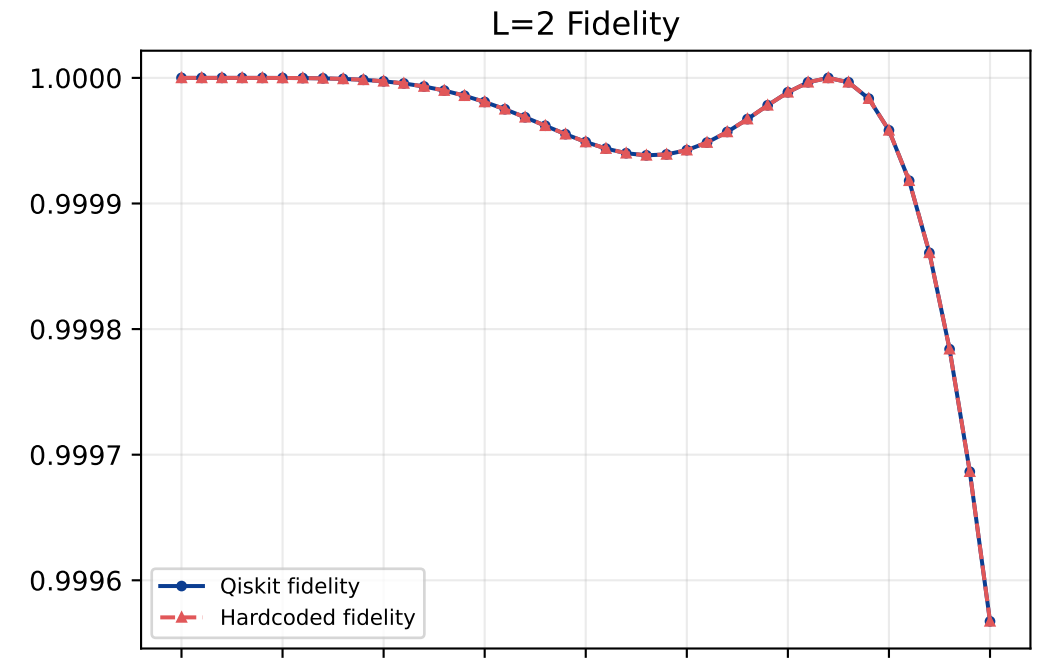

VQE Absolute Error (linear)
|Hardcoded VQE - Exact(filtered)|
|Qiskit VQE - Exact(filtered)|
Absolute Error
0
1
2
3
4
5
6
L=2
L=3
L=4

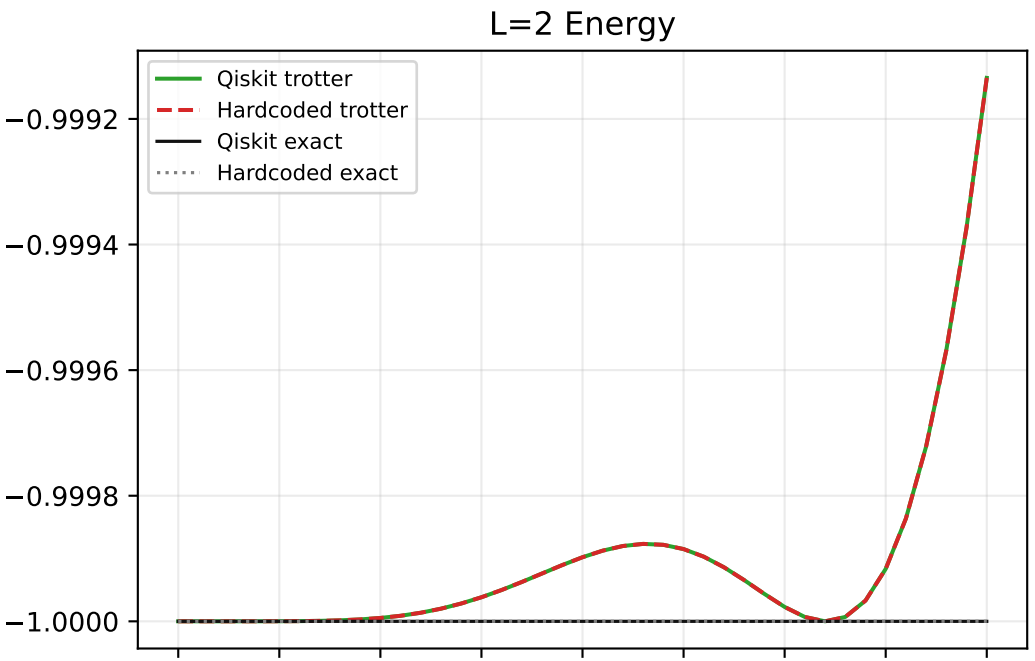

VQE Cross-Implementation Delta
|Hardcoded VQE - Qiskit VQE|
Absolute Delta
0.2
0.3
0.4
0.5
0.6
0.7
L=2
L=3
L=4

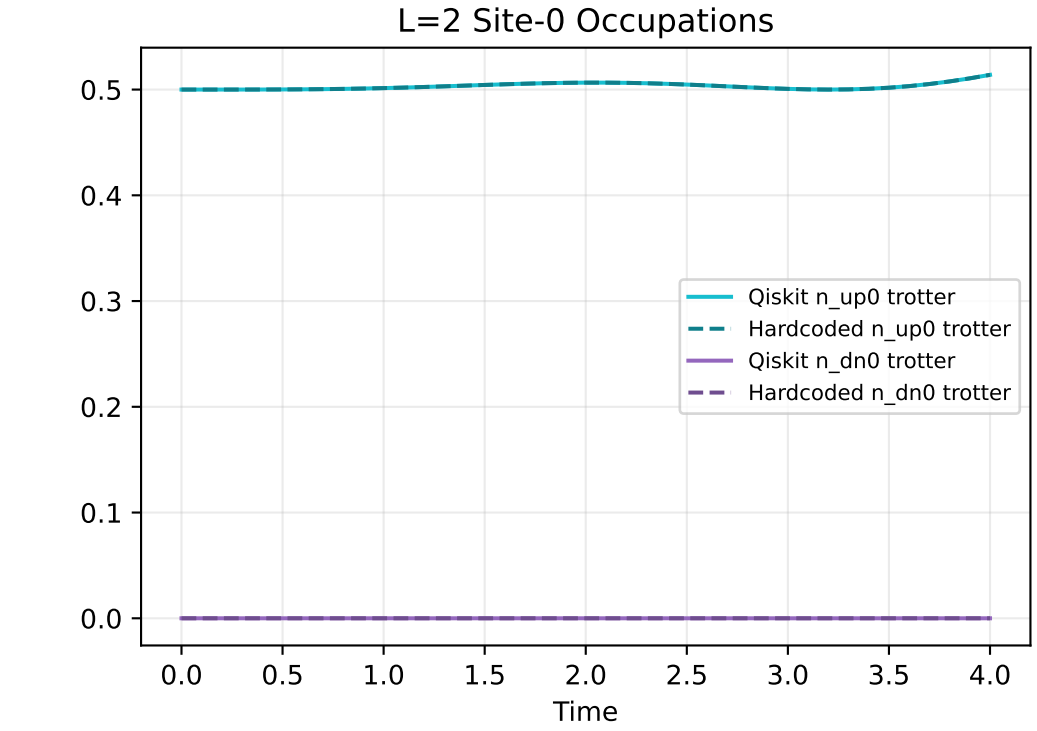

QPE Energy Comparison
Exact (global)
Hardcoded QPE
Qiskit QPE
Energy
−1.0
−1.5
−2.0
−2.5
−3.0
−3.5
L=2
L=3
L=4

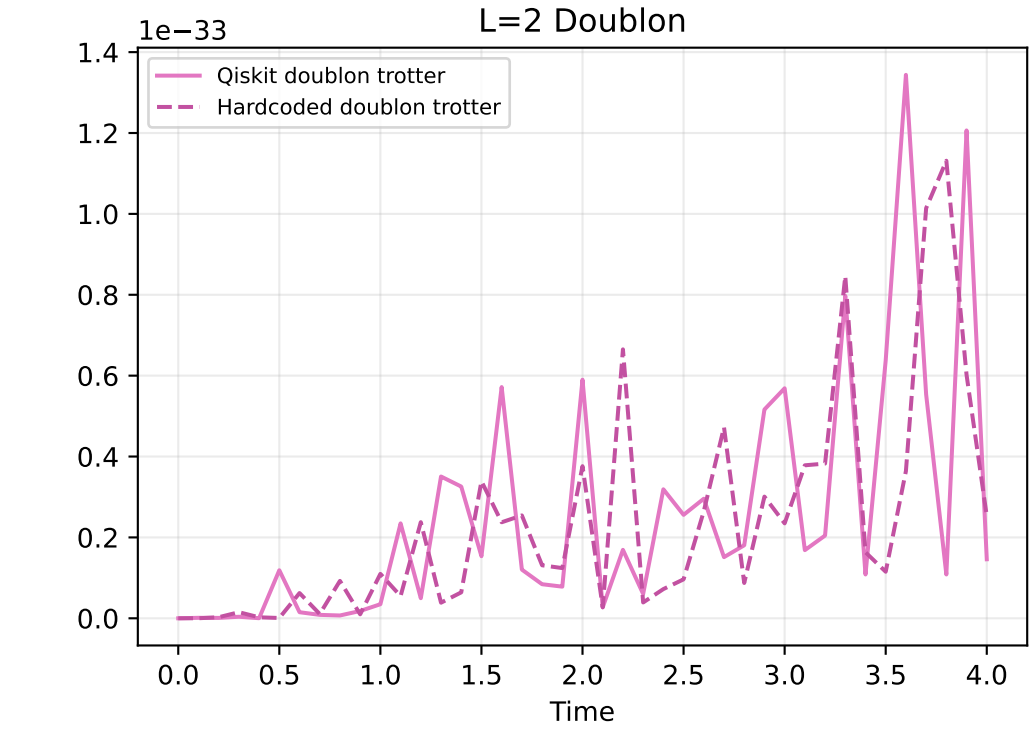

QPE Absolute Error (linear)
|Hardcoded QPE - Exact(global)|
|Qiskit QPE - Exact(global)|
Absolute Error
0.30
0.25
0.20
0.15
0.10
0.05
0.00
L=2
L=3
L=4
QPE Cross-Implementation Delta
|Hardcoded QPE - Qiskit QPE|
Absolute Delta
0.04
0.02
0.00
−0.02
−0.04
L=2
L=3
L=4

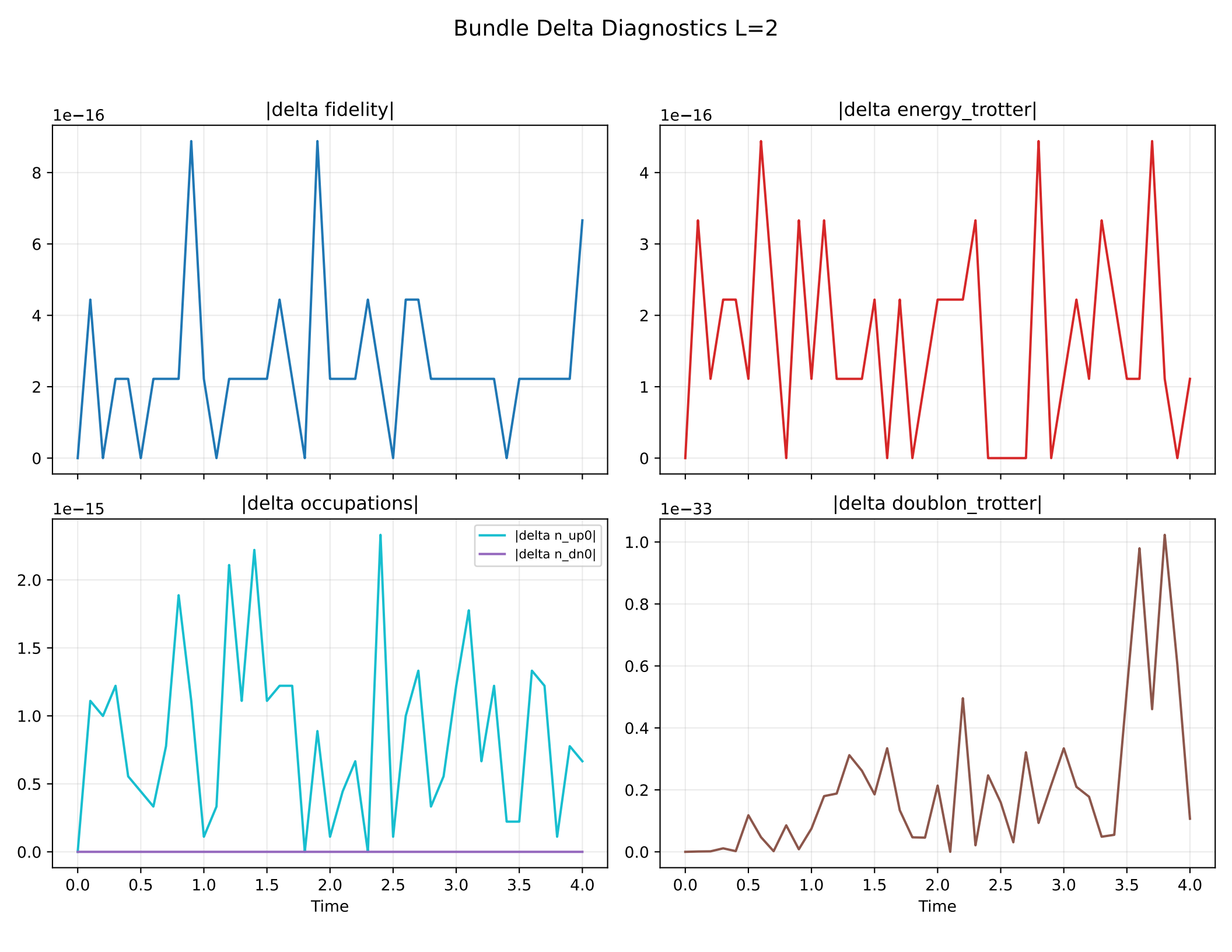
Bundle Page: L=2 Trajectory Comparison










Bundle Delta Diagnostics L=2
|delta fidelity|
1e−16
|delta energy_trotter|
1e−16
|delta occupations|
1e−15
|delta n_up0|
|delta n_dn0|
Time
|delta doublon_trotter|
1e−33
Time

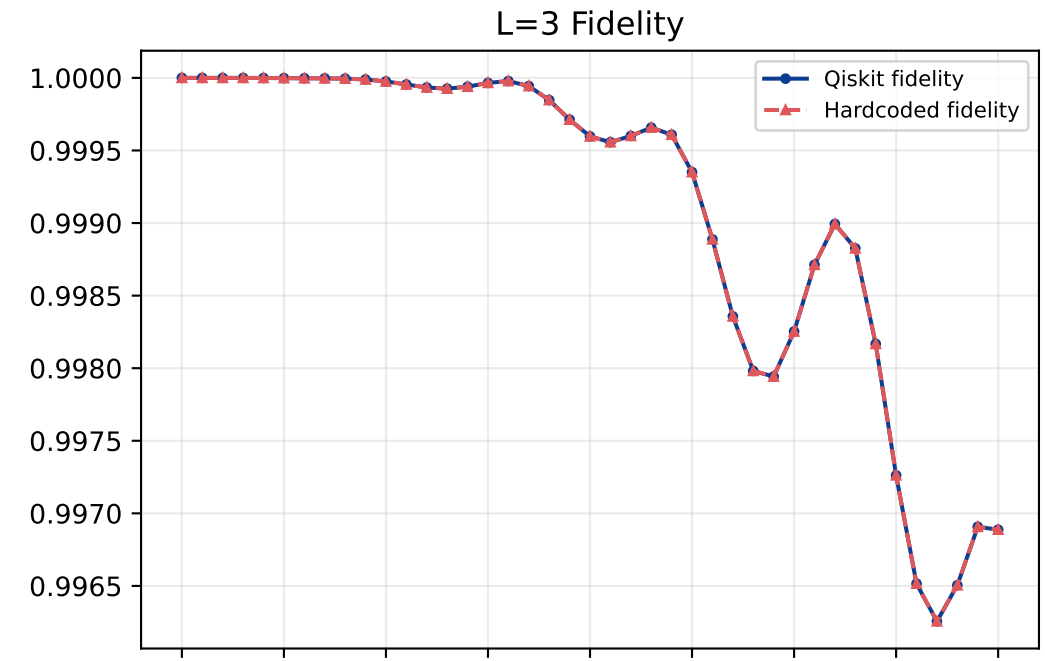
Bundle metrics page L=2

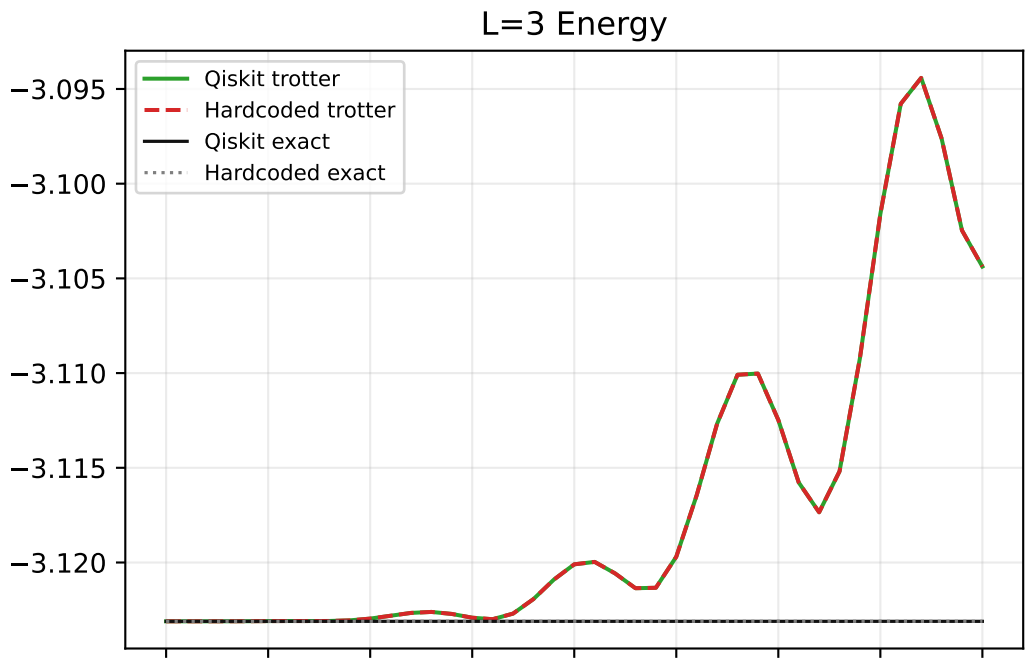
Trotterization comparison uses each path's configured initial state.
For VQE-init runs, both exact(t) and trotter(t) start from the VQE ansatz state.

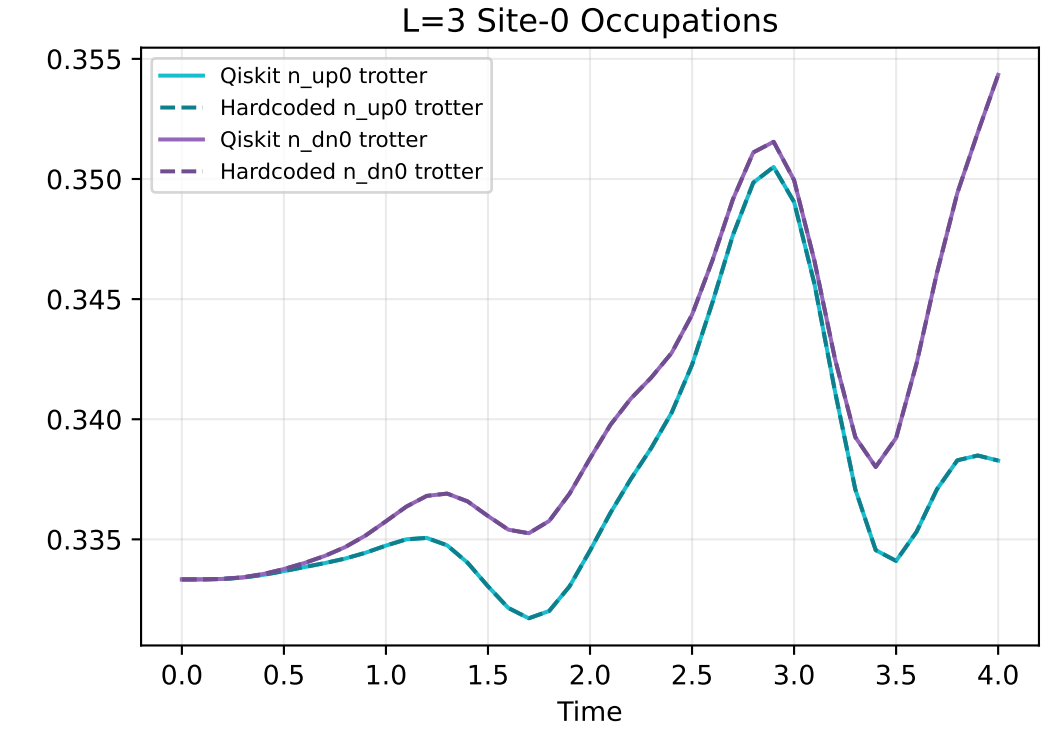
ground_state_energy_abs_delta = 0.0
fidelity max/mean/final = 8.881784197001252e-16 / 2.5453893735308465e-16 / 6.661338147750939e-16
energy_trotter max/mean/final = 4.440892098500626e-16 / 1.624716621402668e-16 / 1.1102230246251565e-16
n_up_site0_trotter max/mean/final = 2.3314683517128287e-15 / 8.556840872720718e-16 / 6.661338147750939e-16
n_dn_site0_trotter max/mean/final = 1.0231502829556905e-33 / 2.039368349484627e-34 / 1.0682892660273295e-34
doublon_trotter max/mean/final = 1.0231502829556905e-33 / 2.039368349484627e-34 / 1.0682892660273295e-34

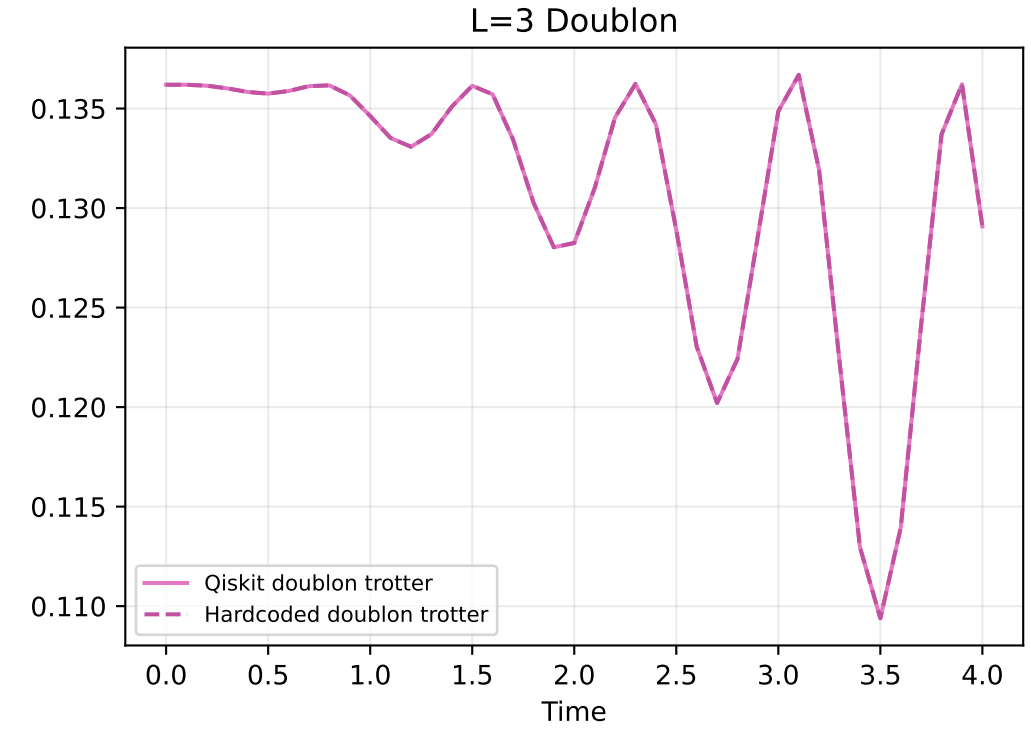
checks = {'ground_state_energy_abs_delta': True, 'fidelity_max_abs_delta': True, 'energy_trotter_max_abs_delta': True, 'n_up_s
PASS = True

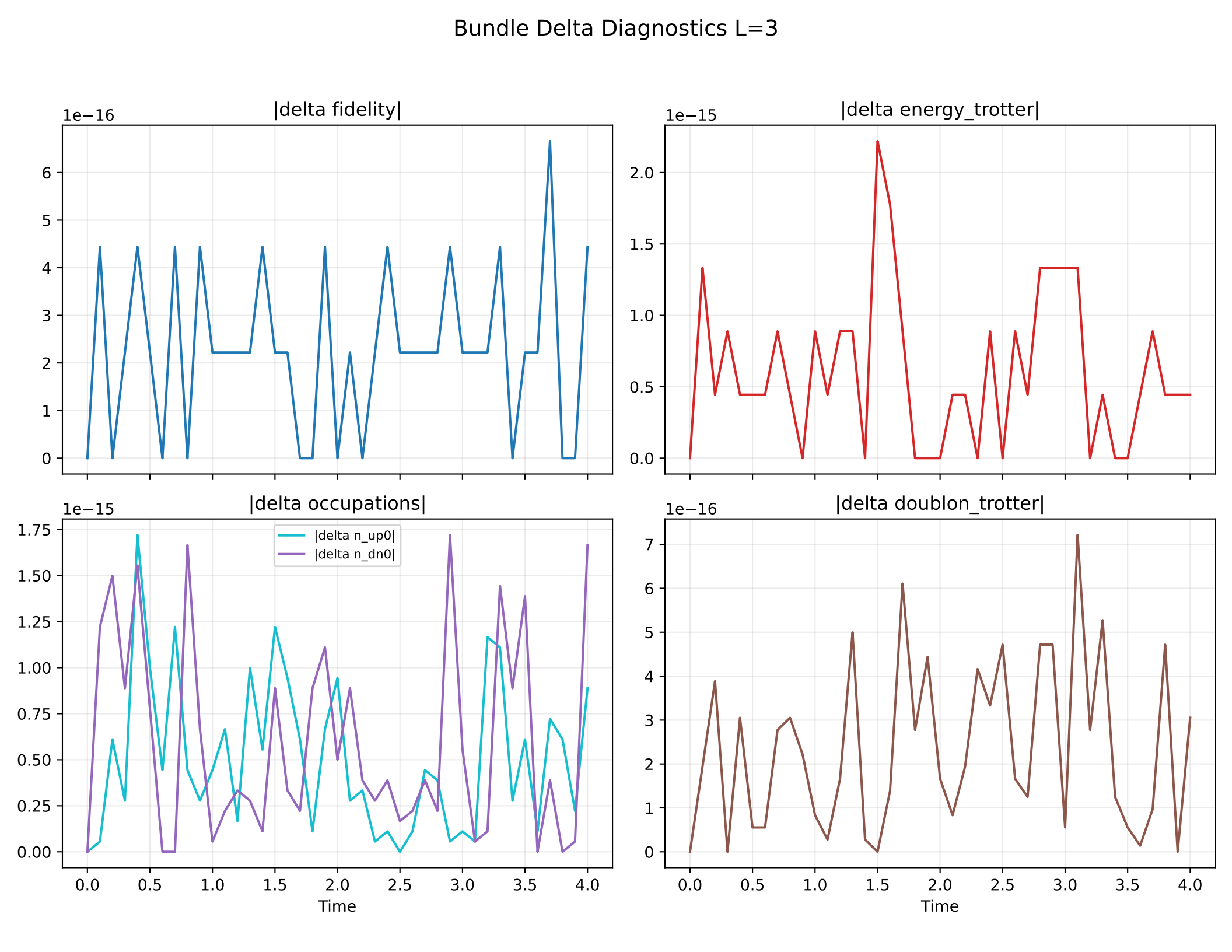
Bundle Page: L=3 Trajectory Comparison





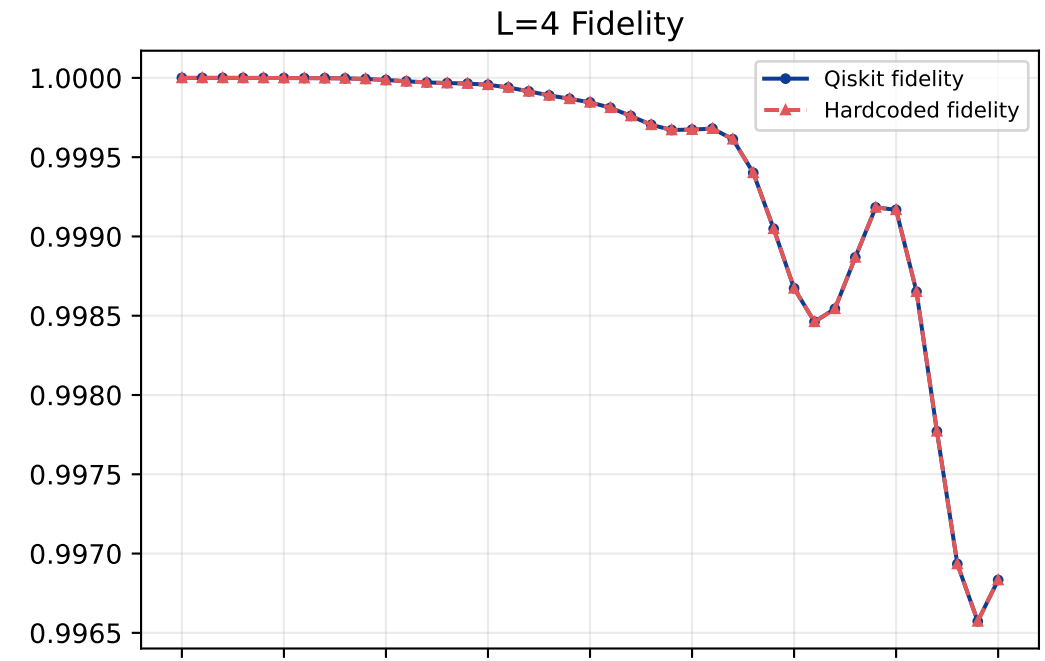


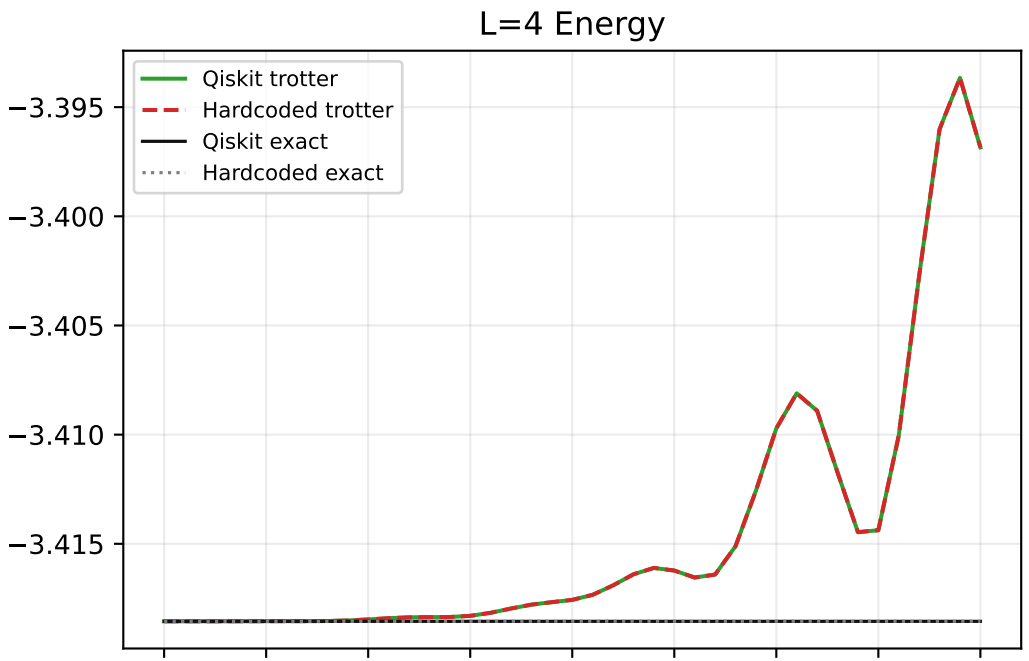


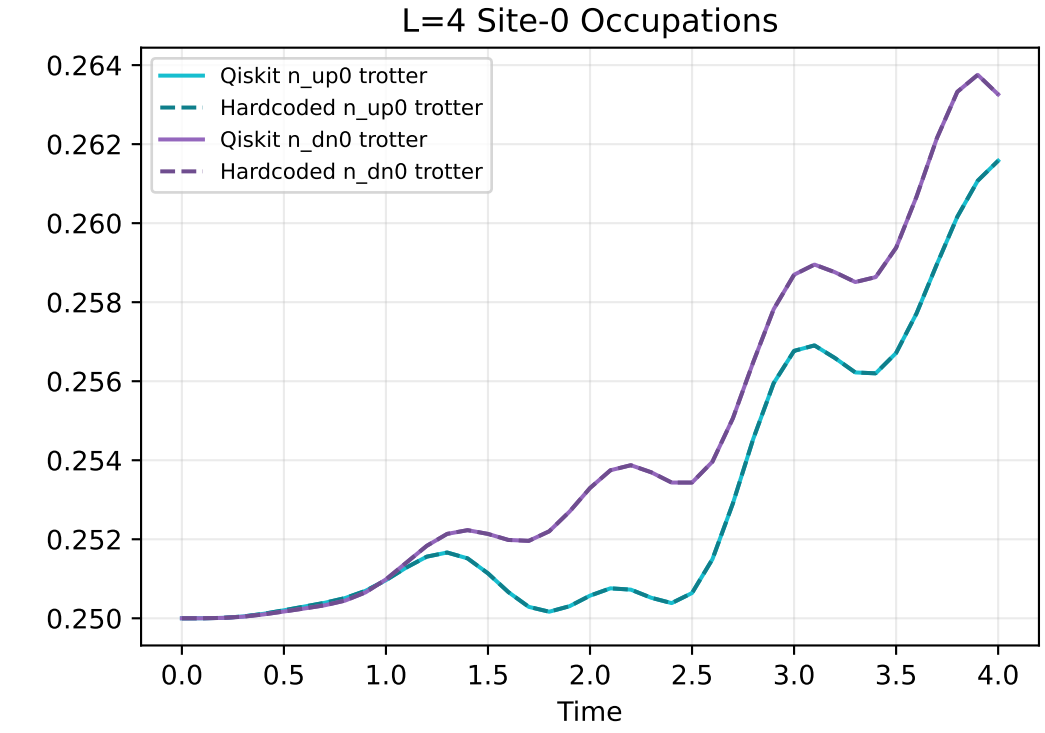

Bundle Delta Diagnostics L=3
|delta fidelity|
1e−16
|delta energy_trotter|
1e−15
|delta occupations|
1e−15
|delta n_up0|
|delta n_dn0|
|delta doublon_trotter|
1e−16
Time
Time

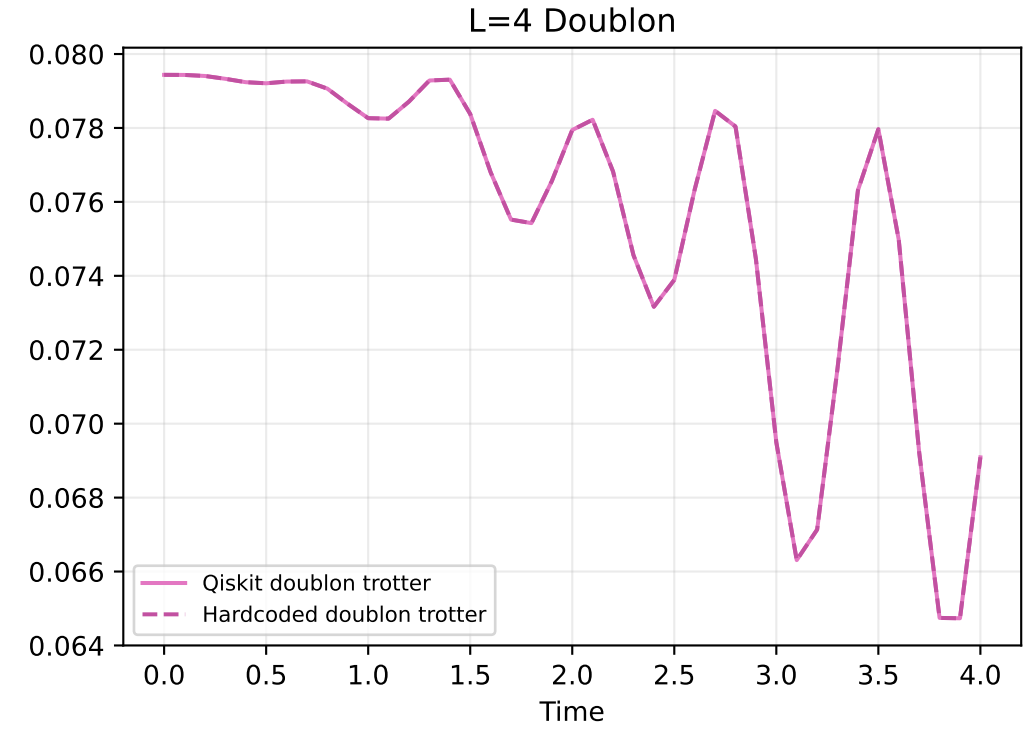
```
Bundle metrics page L=3

Trotterization comparison uses each path's configured initial state.
For VQE-init runs, both exact(t) and trotter(t) start from the VQE ansatz state.

ground_state_energy_abs_delta = 0.0
fidelity max/mean/final = 6.661338147750939e-16 / 2.2746032699637354e-16 / 4.440892098500626e-16
energy_trotter max/mean/final = 2.220446049250313e-15 / 6.065608719903295e-16 / 4.440892098500626e-16
n_up_site0_trotter max/mean/final = 1.7208456881689926e-15 / 5.13139666259676e-16 / 8.881784197001252e-16
n_dn_site0_trotter max/mean/final = 1.7208456881689926e-15 / 5.95729427847645e-16 / 1.6653345369377348e-15
doublon_trotter max/mean/final = 7.216449660063518e-16 / 2.349069448444691e-16 / 3.0531133177191805e-16

checks = {'ground_state_energy_abs_delta': True, 'fidelity_max_abs_delta': True, 'energy_trotter_max_abs_delta': True, 'n_up_s
PASS = True
```

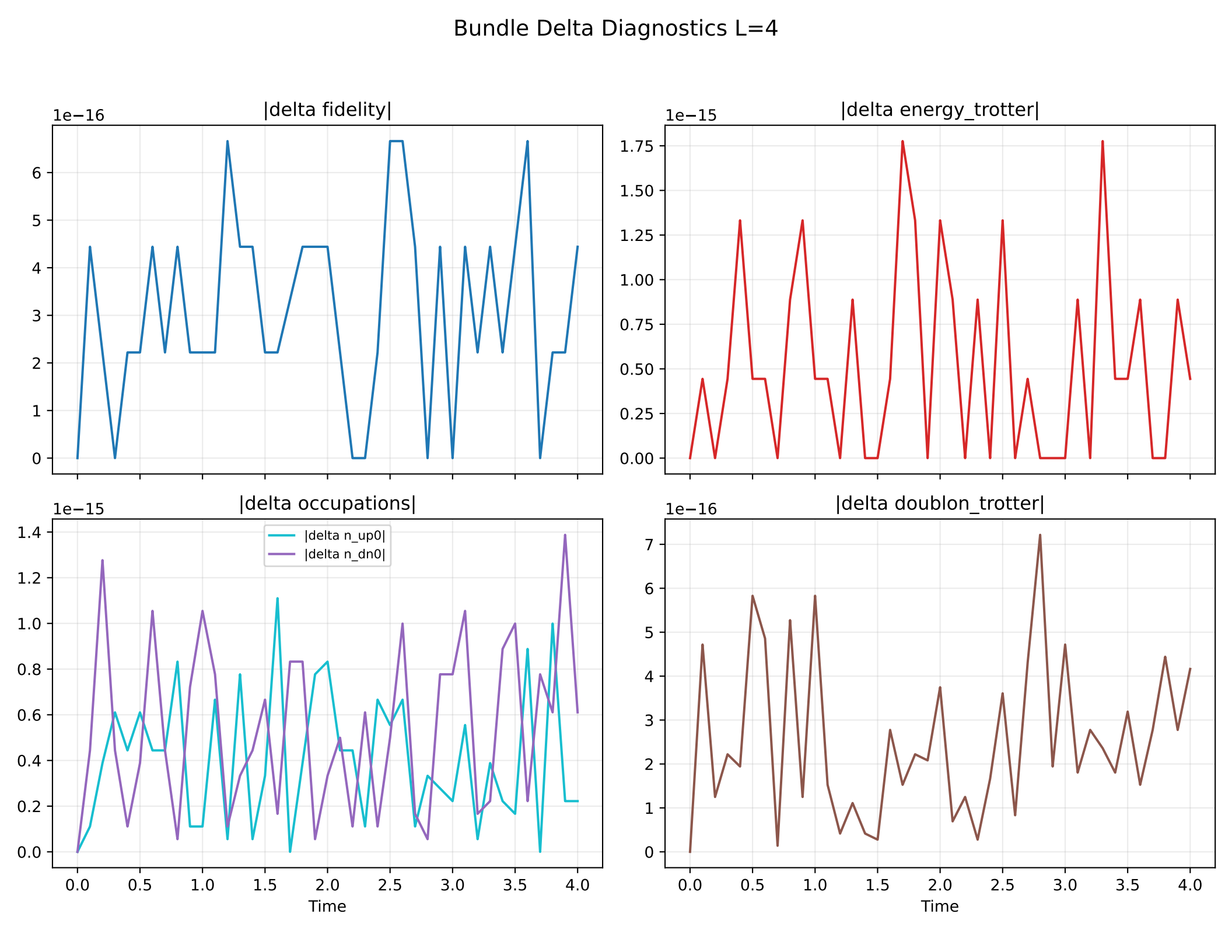
Bundle Page: L=4 Trajectory Comparison










Bundle Delta Diagnostics L=4
|delta fidelity|
1e−16
|delta energy_trotter|
1e−15
|delta occupations|
1e−15
|delta n_up0|
|delta n_dn0|
|delta doublon_trotter|
1e−16
Time
Time

```
Bundle metrics page L=4

Trotterization comparison uses each path's configured initial state.
For VQE-init runs, both exact(t) and trotter(t) start from the VQE ansatz state.

ground_state_energy_abs_delta = 0.0
fidelity max/mean/final = 6.661338147750939e-16 / 3.059882970308358e-16 / 4.440892098500626e-16
energy_trotter max/mean/final = 1.776356839400250 5e-15 / 5.199093188488538e-16 / 4.440892098500626e-16
n_up_site0_trotter max/mean/final = 1.1102230246251565e-15 / 4.0617915535066704e-16 / 2.220446049250313e-16
n_dn_site0_trotter max/mean/final = 1.3877787807814457e-15 / 5.388643460985516e-16 / 6.106226635438361e-16
doublon_trotter max/mean/final = 7.216449660063518e-16 / 2.5250804157633134e-16 / 4.163336342344337e-16

checks = {'ground_state_energy_abs_delta': True, 'fidelity_max_abs_delta': True, 'energy_trotter_max_abs_delta': True, 'n_up_s
PASS = True
```