```
Hardcoded vs Qiskit Pipeline Comparison Summary

generated_utc: 2026-02-14T00:14:13.801819+00:00
all_pass: False
l_values: [2, 3]
trajectory_comparison_basis: trotter trajectories start from
  each pipeline's selected initial_state_source (default: vqe)

thresholds:
{'doublon_trotter_max_abs_delta': 0.001,
 'energy_trotter_max_abs_delta': 0.001,
 'fidelity_max_abs_delta': 0.0001,
 'ground_state_energy_abs_delta': 1e-08,
 'n_dn_site0_trotter_max_abs_delta': 0.005,
 'n_up_site0_trotter_max_abs_delta': 0.005}

hardcoded_qiskit_import_isolation:
{'offending_imports': [],
 'pass': True,
 'qiskit_imports': [{'line': 307, 'module': 'qiskit'},
                    {'line': 308, 'module': 'qiskit.circuit.library'},
                    {'line': 309, 'module': 'qiskit.primitives'},
                    {'line': 310, 'module': 'qiskit.quantum_info'},
                    {'line': 311, 'module': 'qiskit.synthesis'},
                    {'line': 312, 'module': 'qiskit_algorithms'},
                    {'line': 313, 'module': 'qiskit_algorithms.minimum_eigensolvers'}],
 'qpe_adapter_range': {'end_line': 409, 'start_line': 292}}

Delta metric definitions:
ΔF(t)      = |F_hc(t) - F_qk(t)|
ΔE_trot(t) = |E_trot_hc(t) - E_trot_qk(t)|
Δn_up0(t)  = |n_up0_hc(t) - n_up0_qk(t)|
Δn_dn0(t)  = |n_dn0_hc(t) - n_dn0_qk(t)|
ΔD(t)      = |D_hc(t) - D_qk(t)|
```

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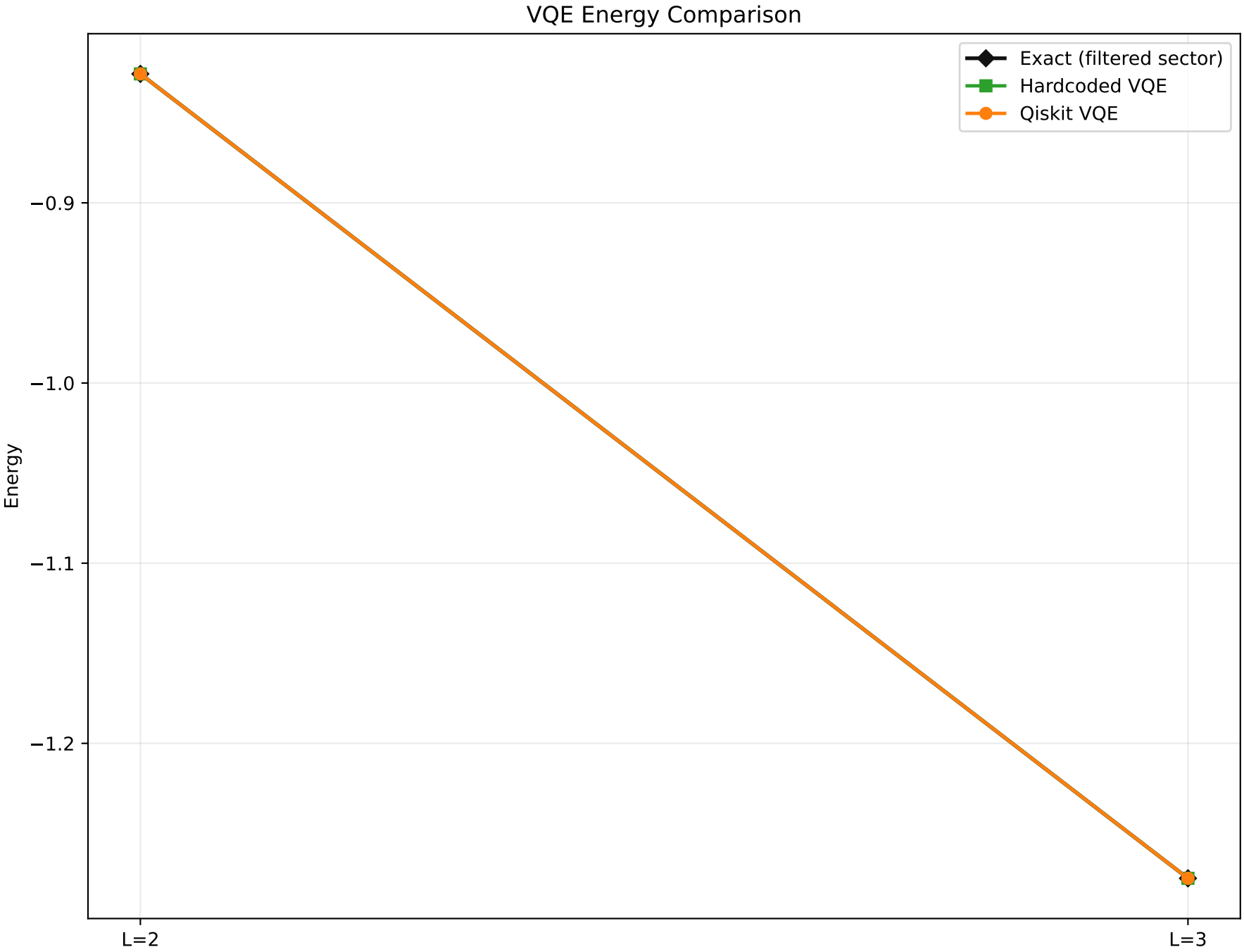
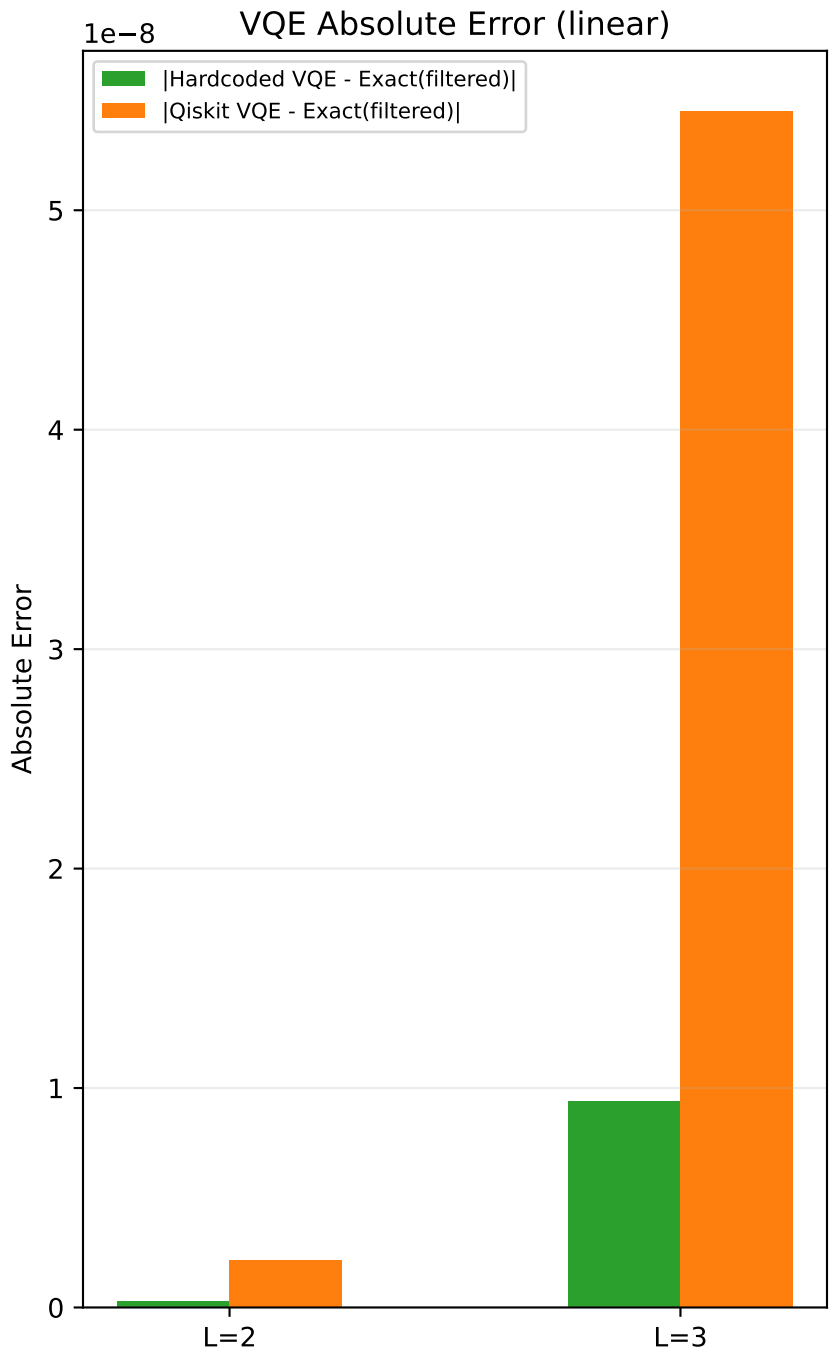
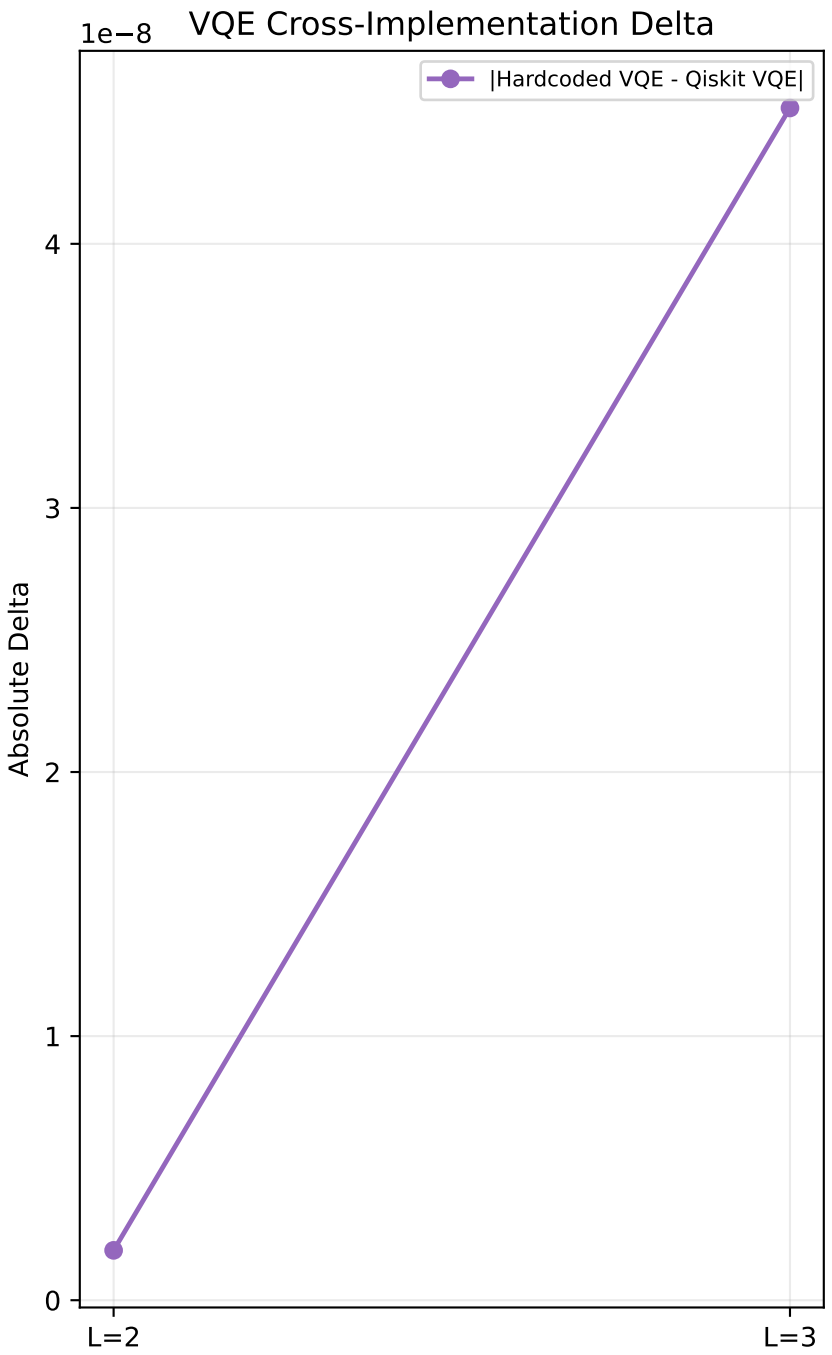
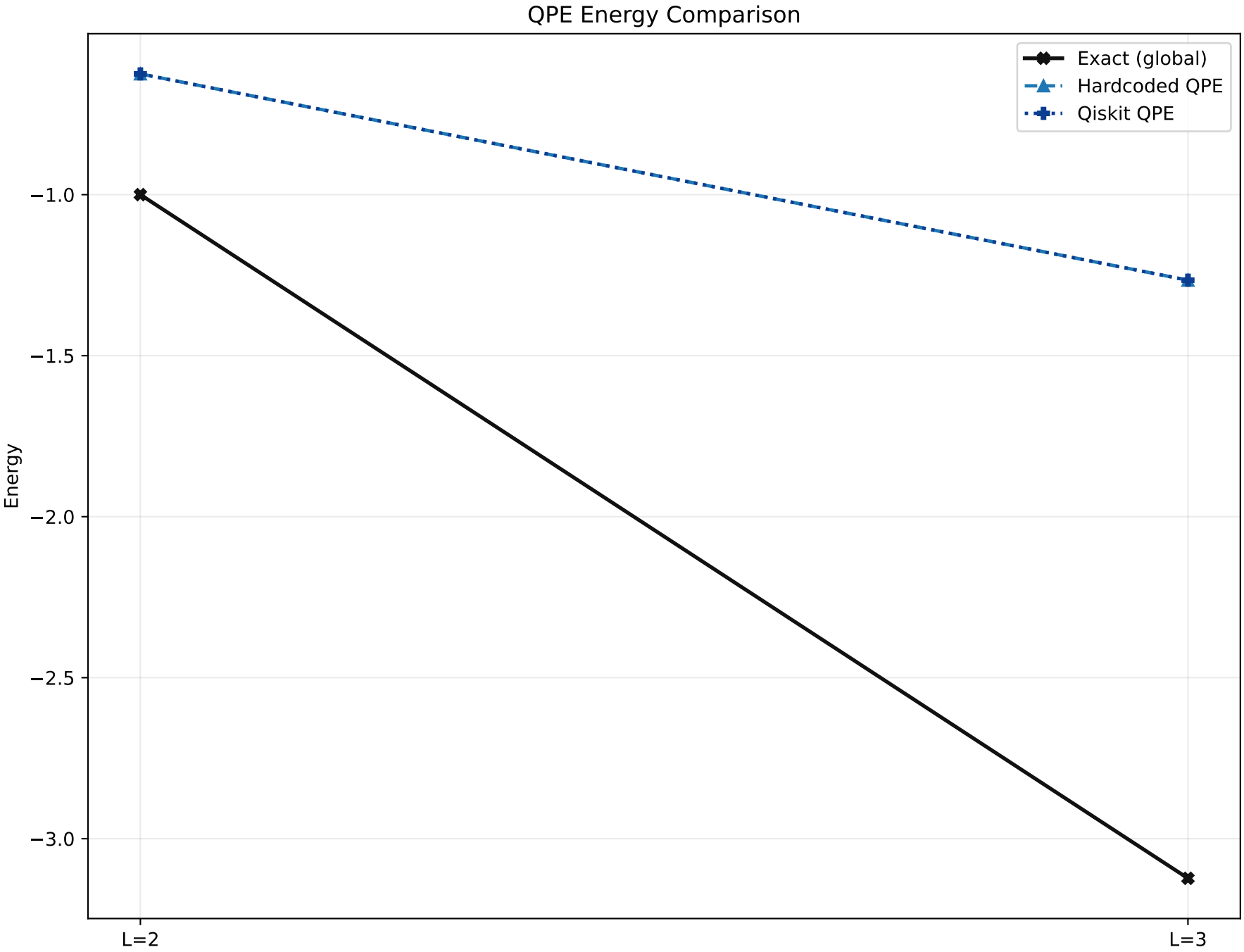
F_pipeline(t) is the pipeline's stored trajectory fidelity value (as computed internally vs that pipeline's exact
    evolution).

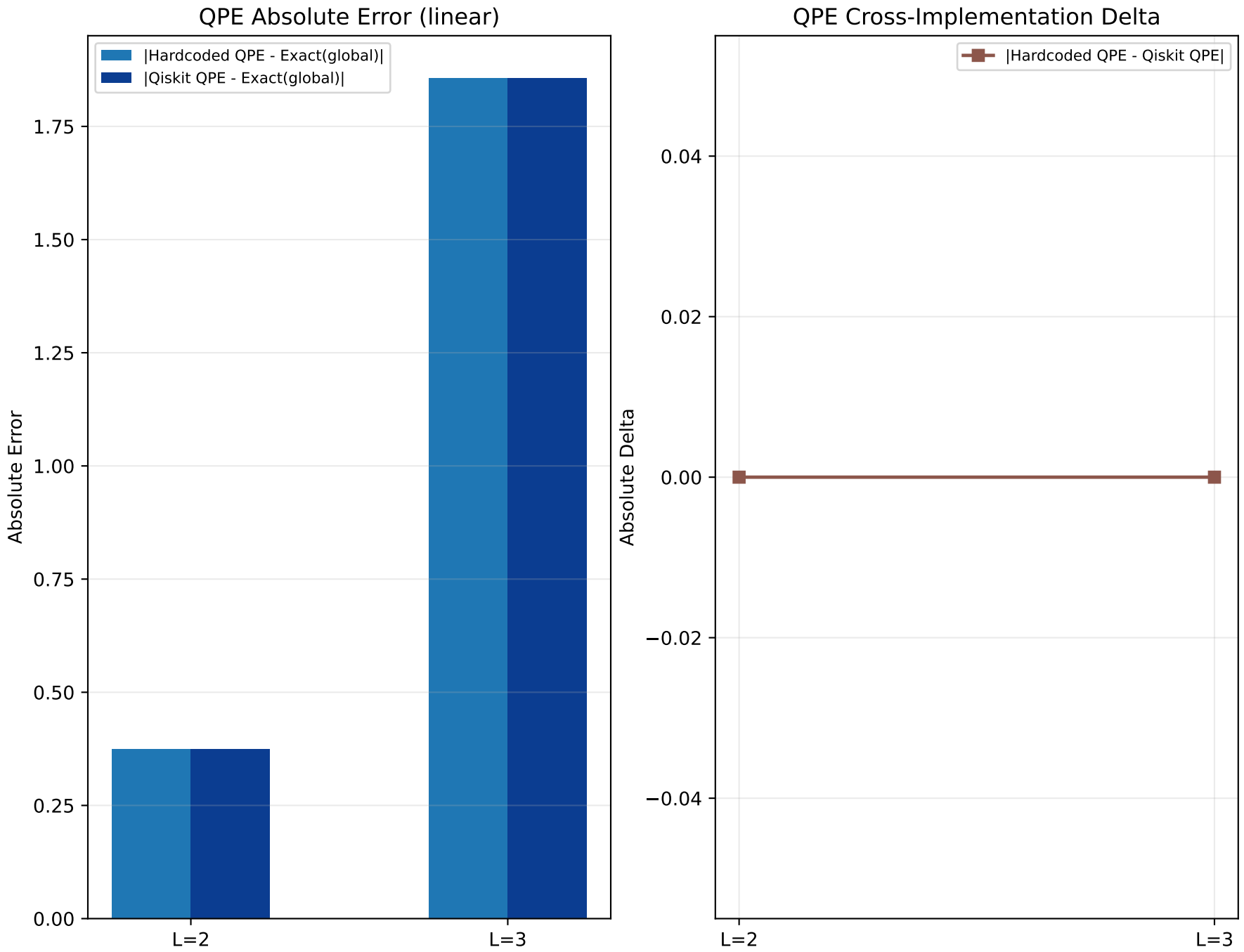
Per-L pass flags:
L=2 pass=True metrics_json=/Users/jakestrobel/Downloads/Testing-For-Trying-Again-main_copy-
    testforatestcuziknothing/artifacts/hardcoded_vs_qiskit_pipeline_L2_metrics.json
L=3 pass=False metrics_json=/Users/jakestrobel/Downloads/Testing-For-Trying-Again-main_copy-
    testforatestcuziknothing/artifacts/hardcoded_vs_qiskit_pipeline_L3_metrics.json
```

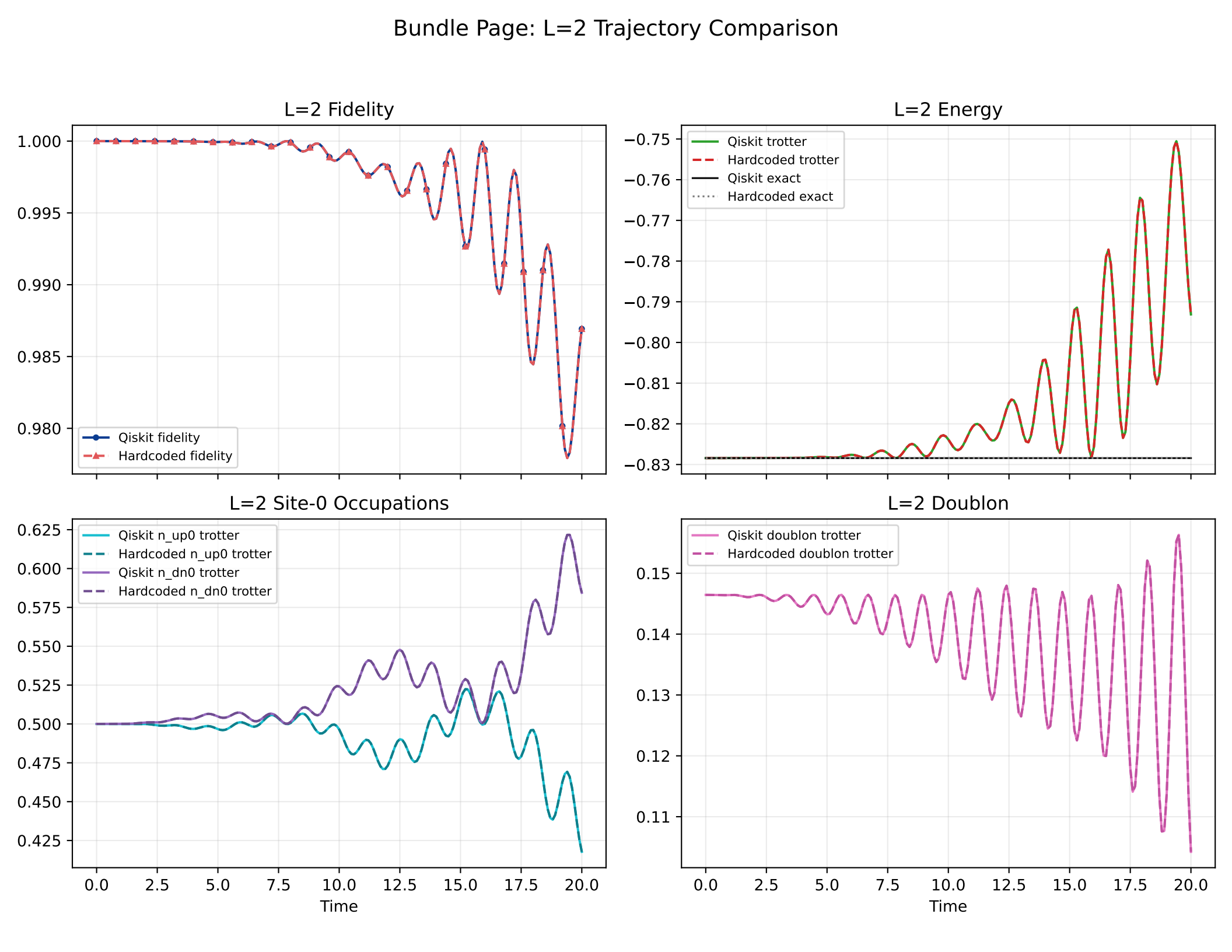

VQE Energy Comparison
Exact (filtered sector)
Hardcoded VQE
Qiskit VQE
Energy
−0.9
−1.0
−1.1
−1.2
L=2
L=3


VQE Absolute Error (linear)
1e−8
|Hardcoded VQE - Exact(filtered)|
|Qiskit VQE - Exact(filtered)|
Absolute Error
0
1
2
3
4
5
L=2
L=3

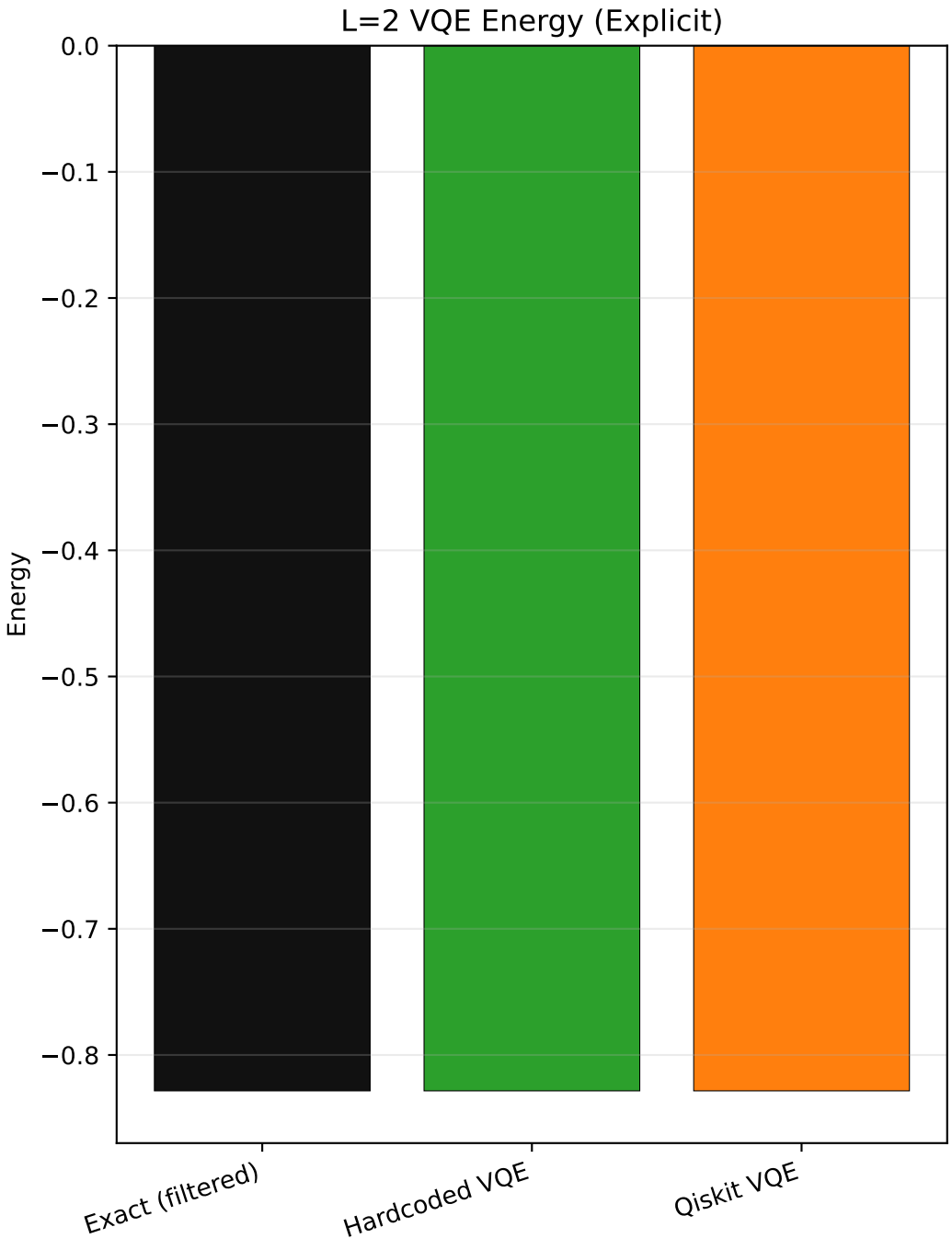

VQE Cross-Implementation Delta
1e−8
|Hardcoded VQE - Qiskit VQE|
Absolute Delta
0
1
2
3
4
L=2
L=3

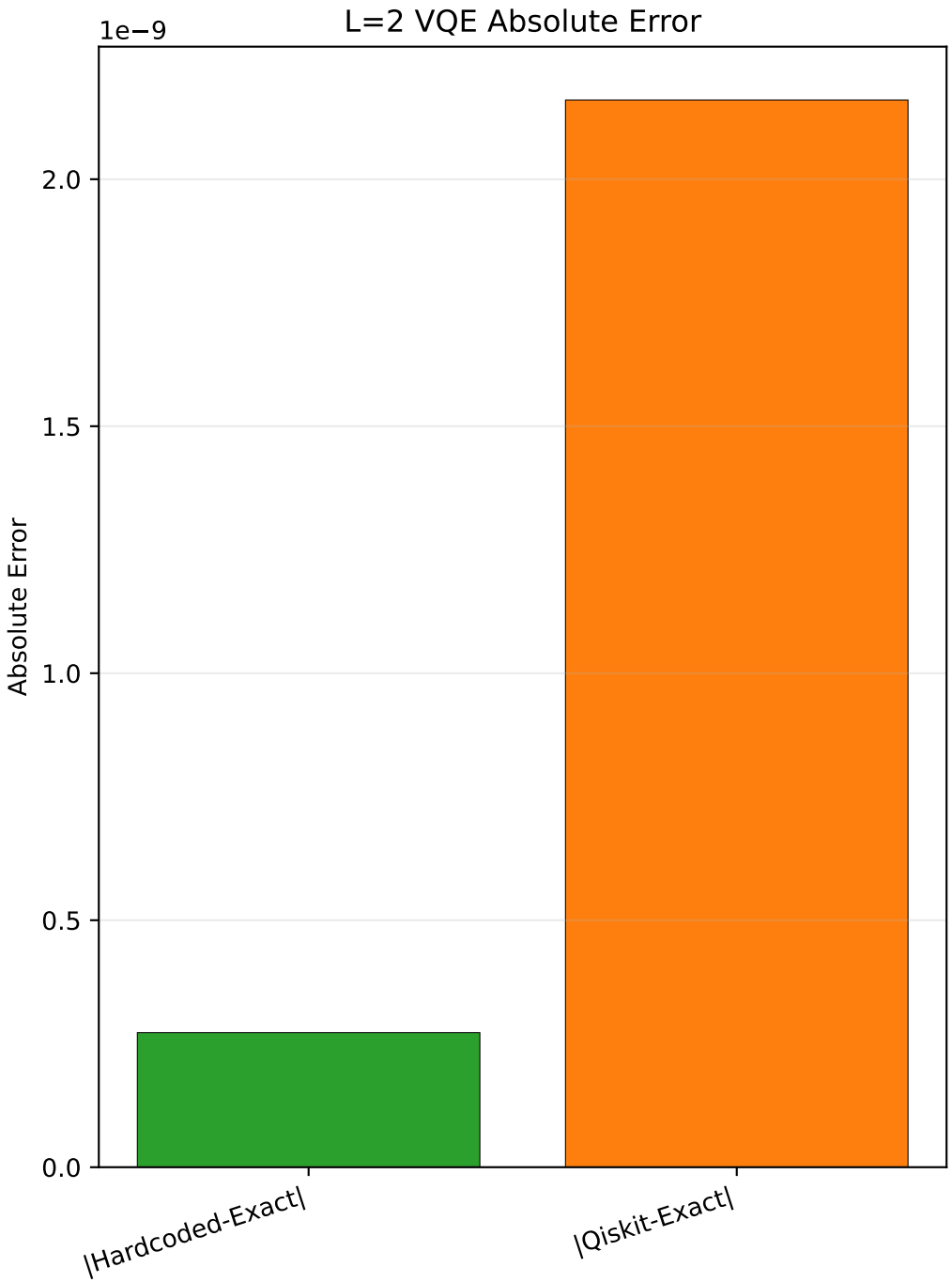

QPE Energy Comparison
Exact (global)
Hardcoded QPE
Qiskit QPE
Energy
−1.0
−1.5
−2.0
−2.5
−3.0
L=2
L=3

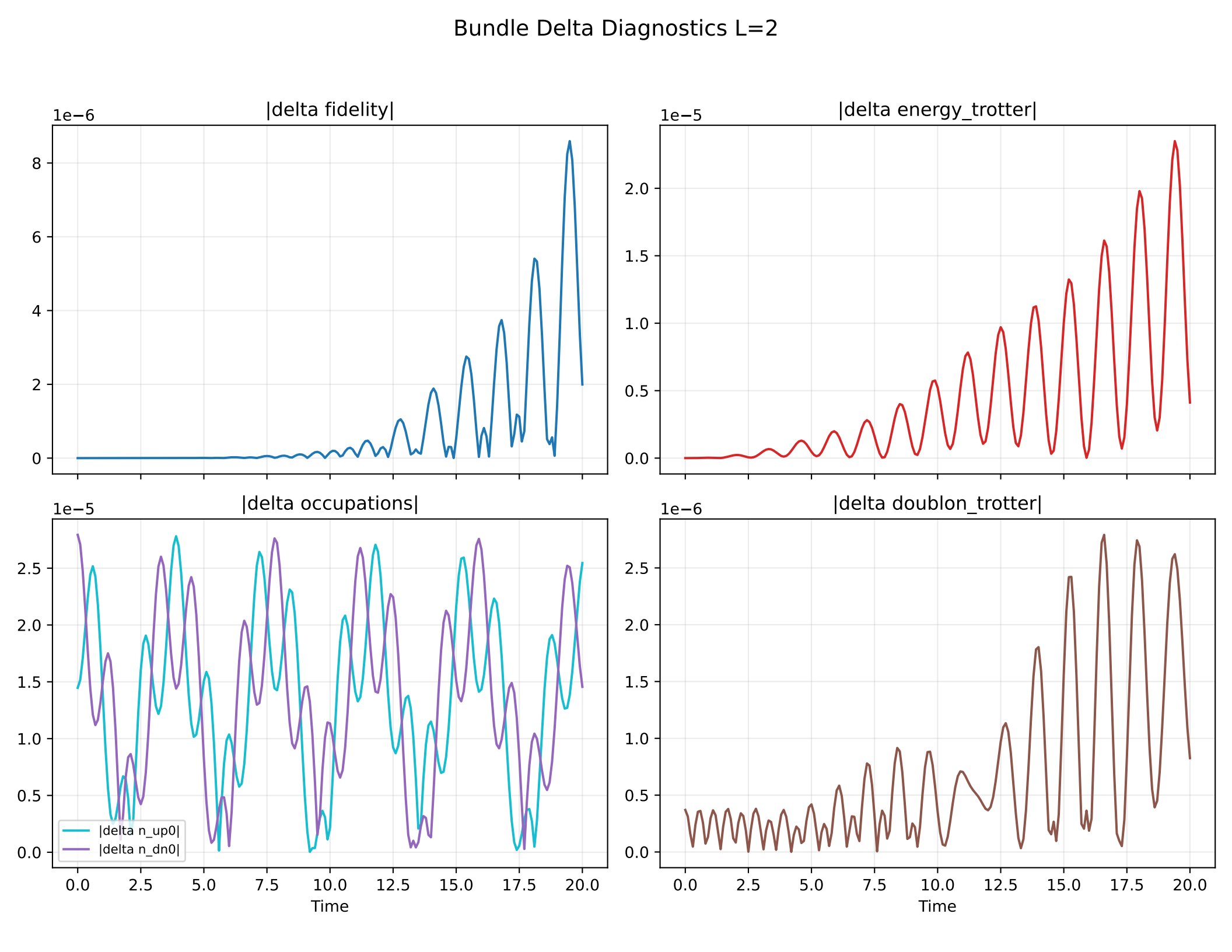

QPE Absolute Error (linear)
|Hardcoded QPE - Exact(global)|
|Qiskit QPE - Exact(global)|
Absolute Error
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
L=2
L=3
QPE Cross-Implementation Delta
|Hardcoded QPE - Qiskit QPE|
Absolute Delta
0.04
0.02
0.00
−0.02
−0.04
L=2
L=3


Bundle Page: L=2 Trajectory Comparison
L=2 Fidelity
Qiskit fidelity
Hardcoded fidelity
L=2 Energy
Qiskit trotter
Hardcoded trotter
Qiskit exact
Hardcoded exact
L=2 Site-0 Occupations
Qiskit n_up0 trotter
Hardcoded n_up0 trotter
Qiskit n_dn0 trotter
Hardcoded n_dn0 trotter
Time
L=2 Doublon
Qiskit doublon trotter
Hardcoded doublon trotter
Time

VQE is a separate quantity from the Trotter t=0 value; do not infer VQE energy from trajectory plots.






Bundle Delta Diagnostics L=2
|delta fidelity|
1e−6
|delta energy_trotter|
1e−5
|delta occupations|
1e−5
|delta n_up0|
|delta n_dn0|
|delta doublon_trotter|
1e−6
Time
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.

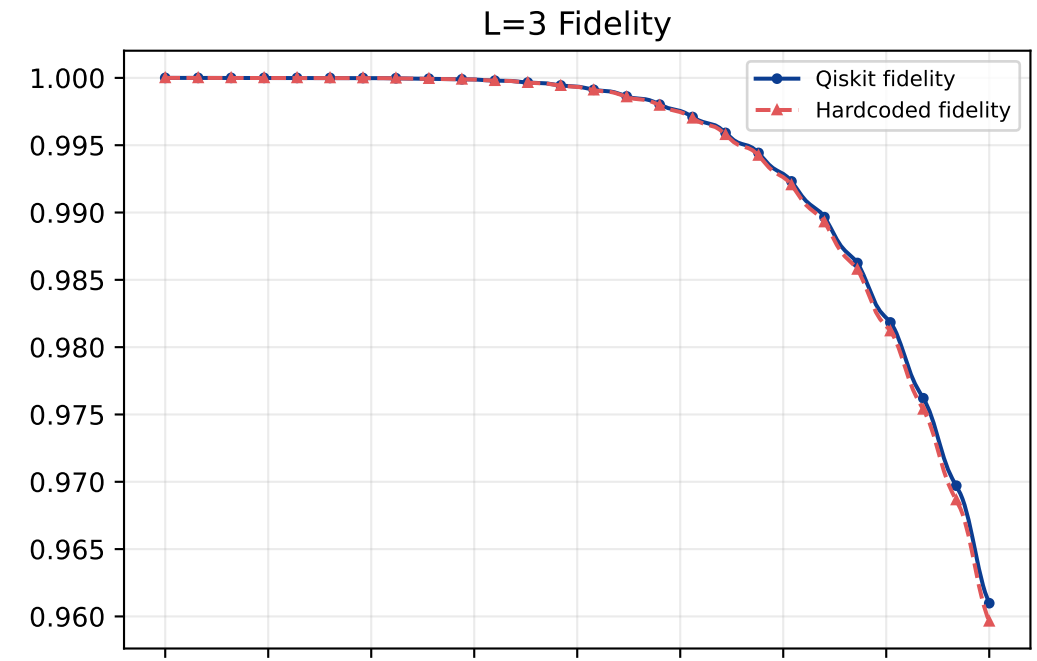
Delta metric definitions:
ΔF(t)      = |F_hc(t) - F_qk(t)|
ΔE_trot(t) = |E_trot_hc(t) - E_trot_qk(t)|
Δn_up0(t)  = |n_up0_hc(t) - n_up0_qk(t)|
Δn_dn0(t)  = |n_dn0_hc(t) - n_dn0_qk(t)|
ΔD(t)      = |D_hc(t) - D_qk(t)|
F_pipeline(t) is the pipeline's stored trajectory fidelity value (as computed internally vs that pipeline's exact
    evolution).

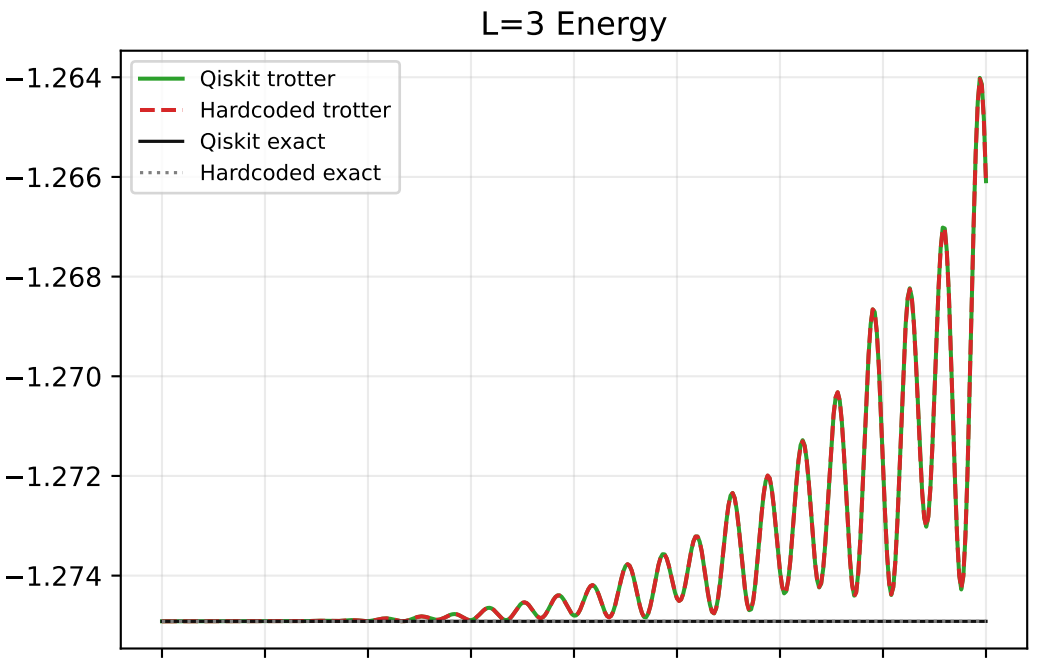
ground_state_energy_abs_delta = 0.0
fidelity max/mean/final = 8.59377818263063e-06 / 8.005364268005184e-07 / 1.9968946775028584e-06
energy_trotter max/mean/final = 2.3499154368722408e-05 / 4.296069546226253e-06 / 4.121644446297701e-06
n_up_site0_trotter max/mean/final = 2.781282510533334e-05 / 1.3631273238300274e-05 / 2.545305309981094e-05
n_dn_site0_trotter max/mean/final = 2.7934482115687942e-05 / 1.3868963351504503e-05 / 1.4557018242267183e-05
doublon_trotter max/mean/final = 2.7910871213676636e-06 / 6.794619643993374e-07 / 8.256188262223407e-07

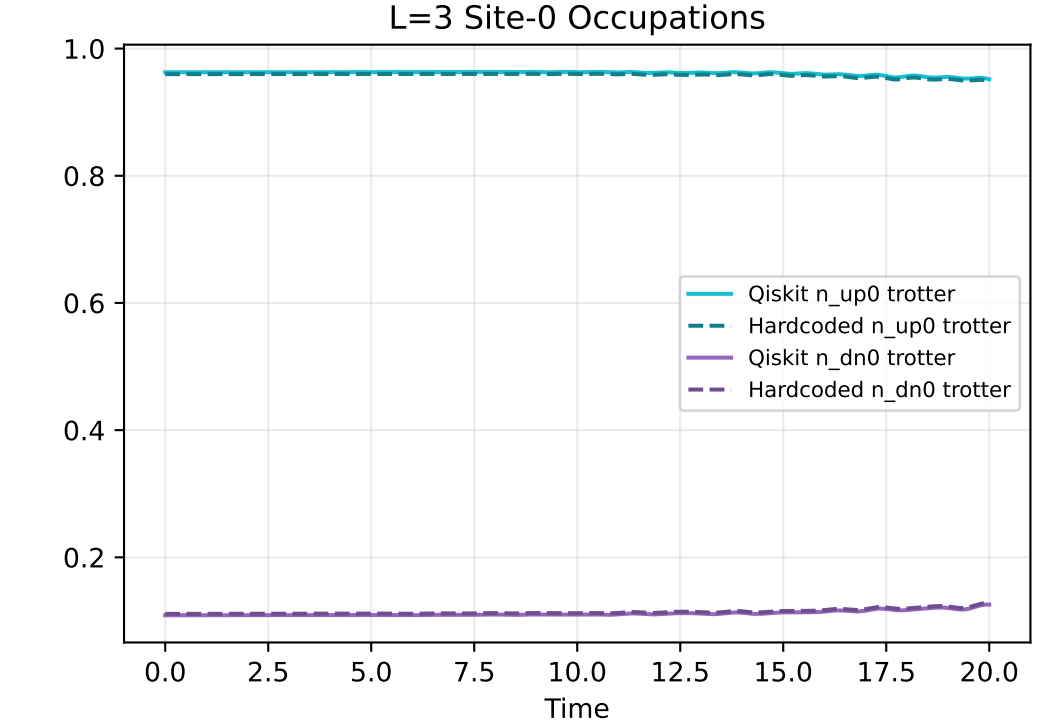
checks:
{'doublon_trotter_max_abs_delta': True,
 'energy_trotter_max_abs_delta': True,
 'fidelity_max_abs_delta': True,
 'ground_state_energy_abs_delta': True,
 'n_dn_site0_trotter_max_abs_delta': True,
 'n_up_site0_trotter_max_abs_delta': True}

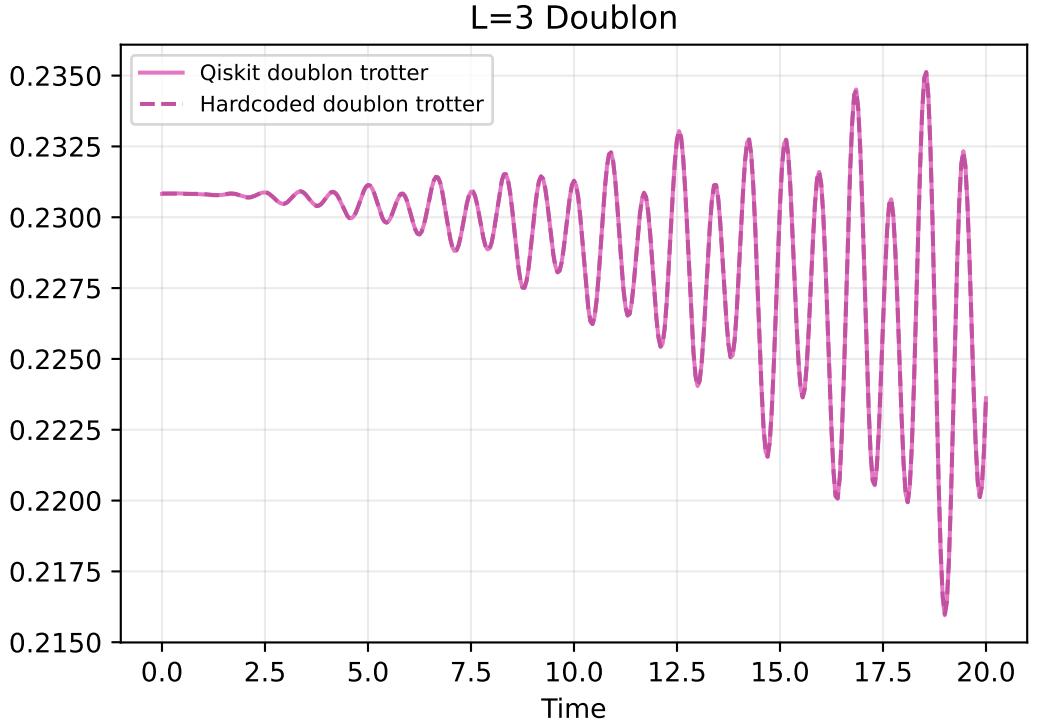
PASS = True
```

Bundle Page: L=3 Trajectory Comparison

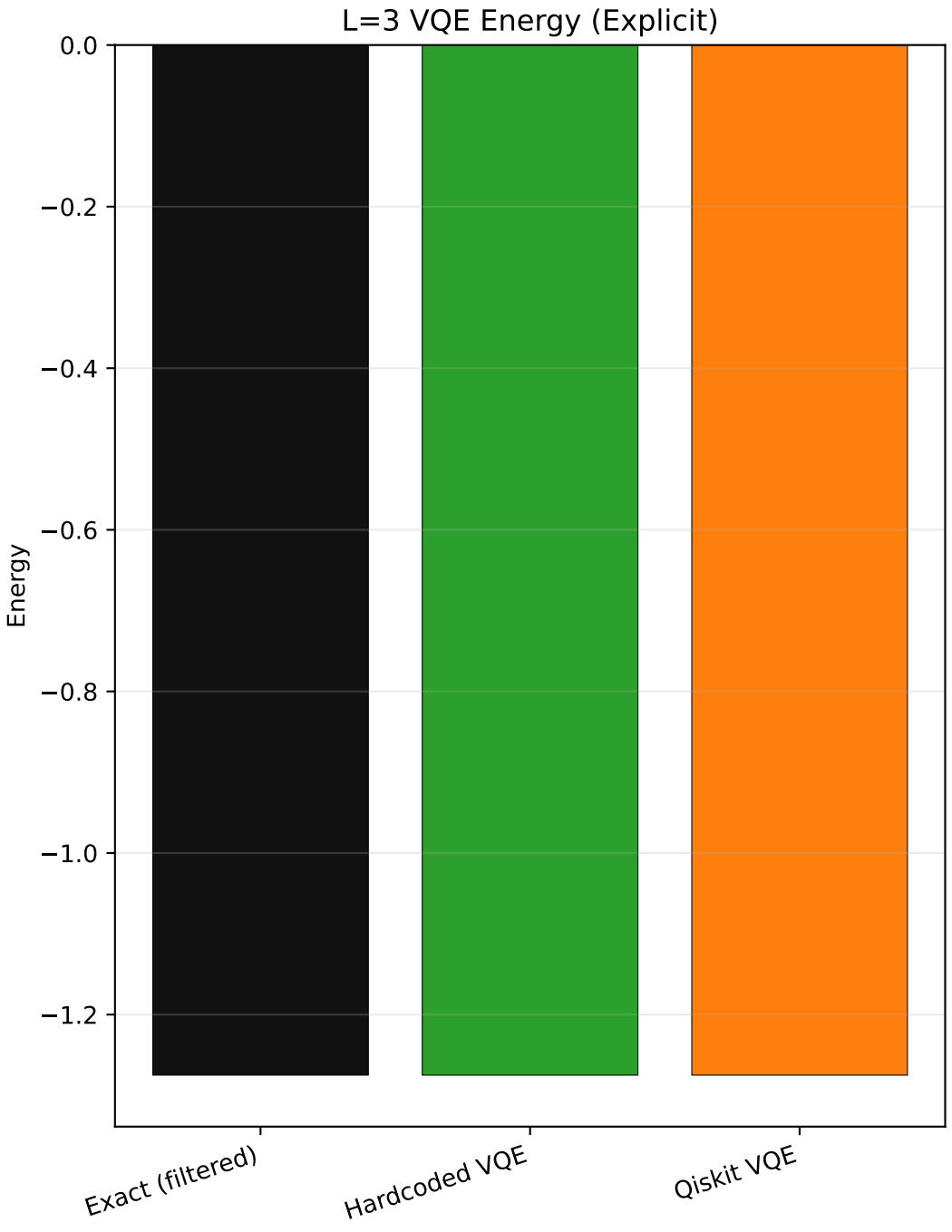


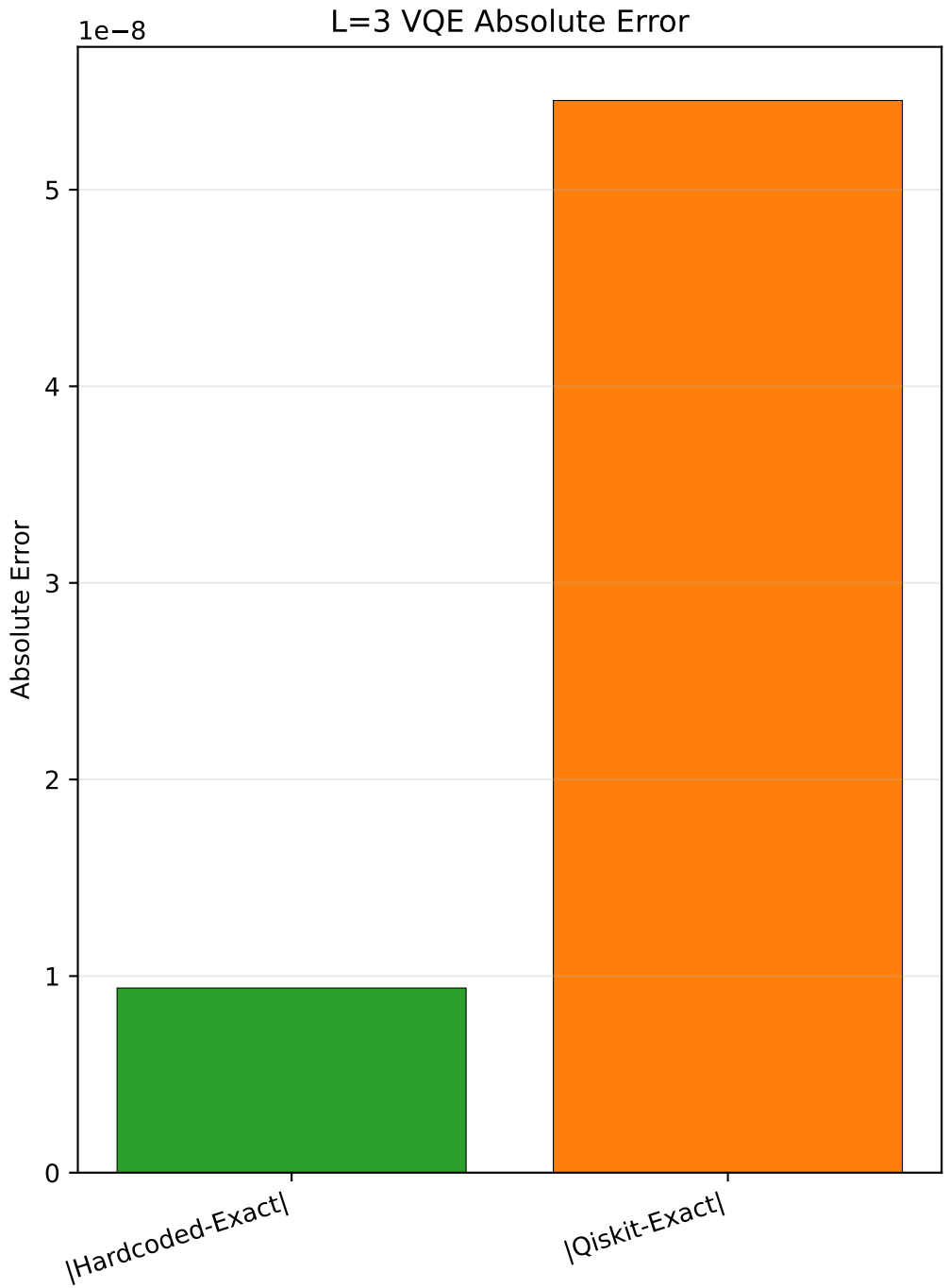


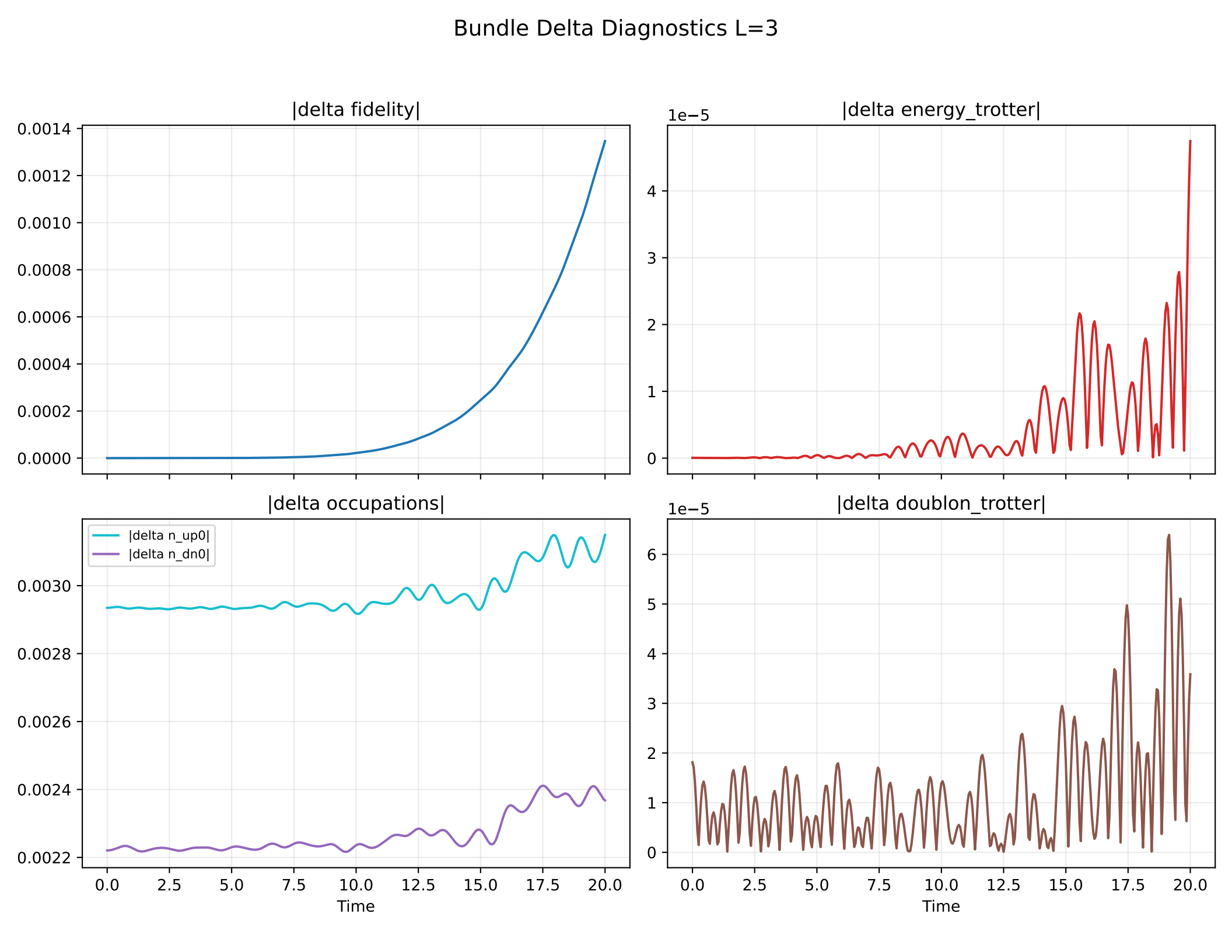




VQE is a separate quantity from the Trotter t=0 value; do not infer VQE energy from trajectory plots.






Bundle Delta Diagnostics L=3
|delta fidelity|
0.0014
0.0012
0.0010
0.0008
0.0006
0.0004
0.0002
0.0000
|delta energy_trotter|
1e−5
4
3
2
1
0
|delta occupations|
|delta n_up0|
|delta n_dn0|
0.0030
0.0028
0.0026
0.0024
0.0022
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
Time
|delta doublon_trotter|
1e−5
6
5
4
3
2
1
0
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
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.

Delta metric definitions:
ΔF(t)      = |F_hc(t) - F_qk(t)|
ΔE_trot(t) = |E_trot_hc(t) - E_trot_qk(t)|
Δn_up0(t)  = |n_up0_hc(t) - n_up0_qk(t)|
Δn_dn0(t)  = |n_dn0_hc(t) - n_dn0_qk(t)|
ΔD(t)      = |D_hc(t) - D_qk(t)|
F_pipeline(t) is the pipeline's stored trajectory fidelity value (as computed internally vs that pipeline's exact
    evolution).

ground_state_energy_abs_delta = 0.0
fidelity max/mean/final = 0.0013464071626839713 / 0.00019665025721909328 / 0.0013464071626839713
energy_trotter max/mean/final = 4.7458908048580994e-05 / 3.99668035453194e-06 / 4.7458908048580994e-05
n_up_site0_trotter max/mean/final = 0.0031496651890847716 / 0.002975898354829075 / 0.0031496651890847716
n_dn_site0_trotter max/mean/final = 0.0024109550934178353 / 0.00226718670337712 / 0.002368035185029038
doublon_trotter max/mean/final = 6.39293585977807e-05 / 1.1616930205037722e-05 / 3.5848731140875056e-05

checks:
{'doublon_trotter_max_abs_delta': True,
 'energy_trotter_max_abs_delta': True,
 'fidelity_max_abs_delta': False,
 'ground_state_energy_abs_delta': True,
 'n_dn_site0_trotter_max_abs_delta': True,
 'n_up_site0_trotter_max_abs_delta': True}

PASS = False
```