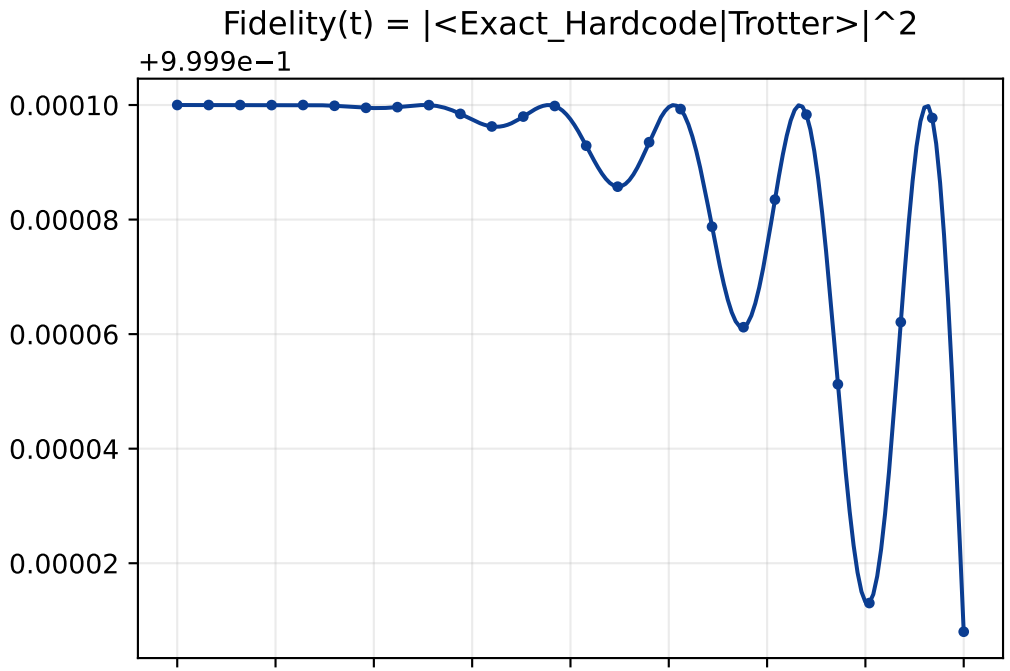
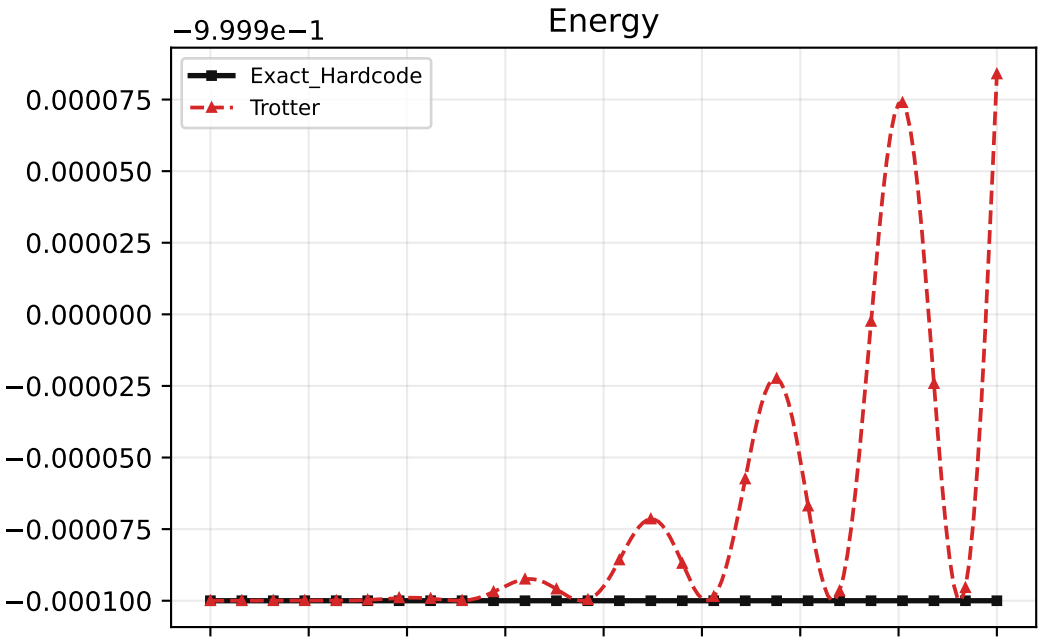
Executed Command

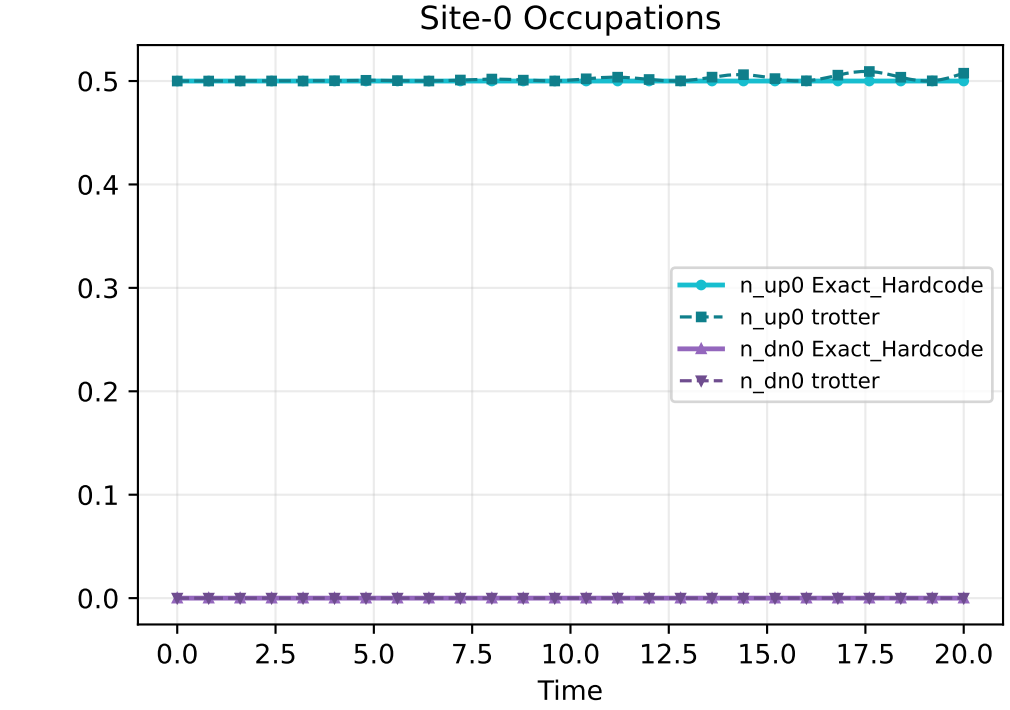
Reference: pipelines/PIPELINE_RUN_GUIDE.md
Script: pipelines/hardcoded_hubbard_pipeline.py

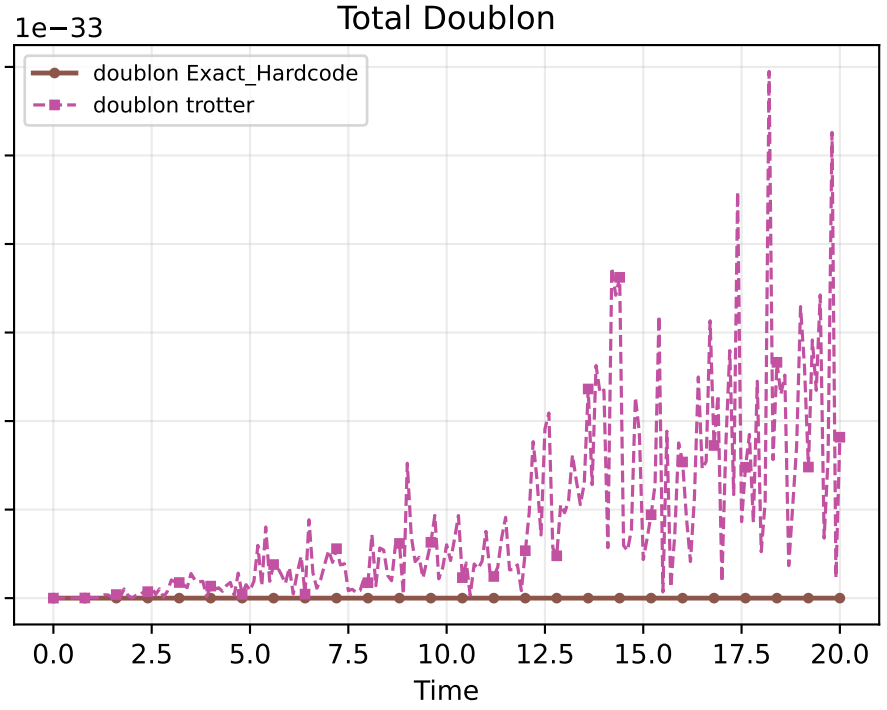
```
/Library/Frameworks/Python.framework/Versions/3.12/bin/python3 Fermi-Hamil-JW-VQE-TROTTER-
  PIPELINE/pipelines/hardcoded_hubbard_pipeline.py --L 2 --initial-state-source exact --t 1.0 --u 4.0 --dv 0.0
  --boundary periodic --ordering blocked --t-final 20.0 --num-times 201 --trotter-steps 128 --enable-drive
  --drive-pattern staggered --drive-A 0.0 --drive-omega 2.0 --drive-tbar 3.0 --drive-phi 0.0 --drive-time-
  sampling midpoint --skip-qpe --vqe-restarts 1 --vqe-maxiter 120 --output-json artifacts/compare_A0_L2.json
  --output-pdf artifacts/compare_A0_L2.pdf
```

Hardcoded Hubbard Pipeline: L=2

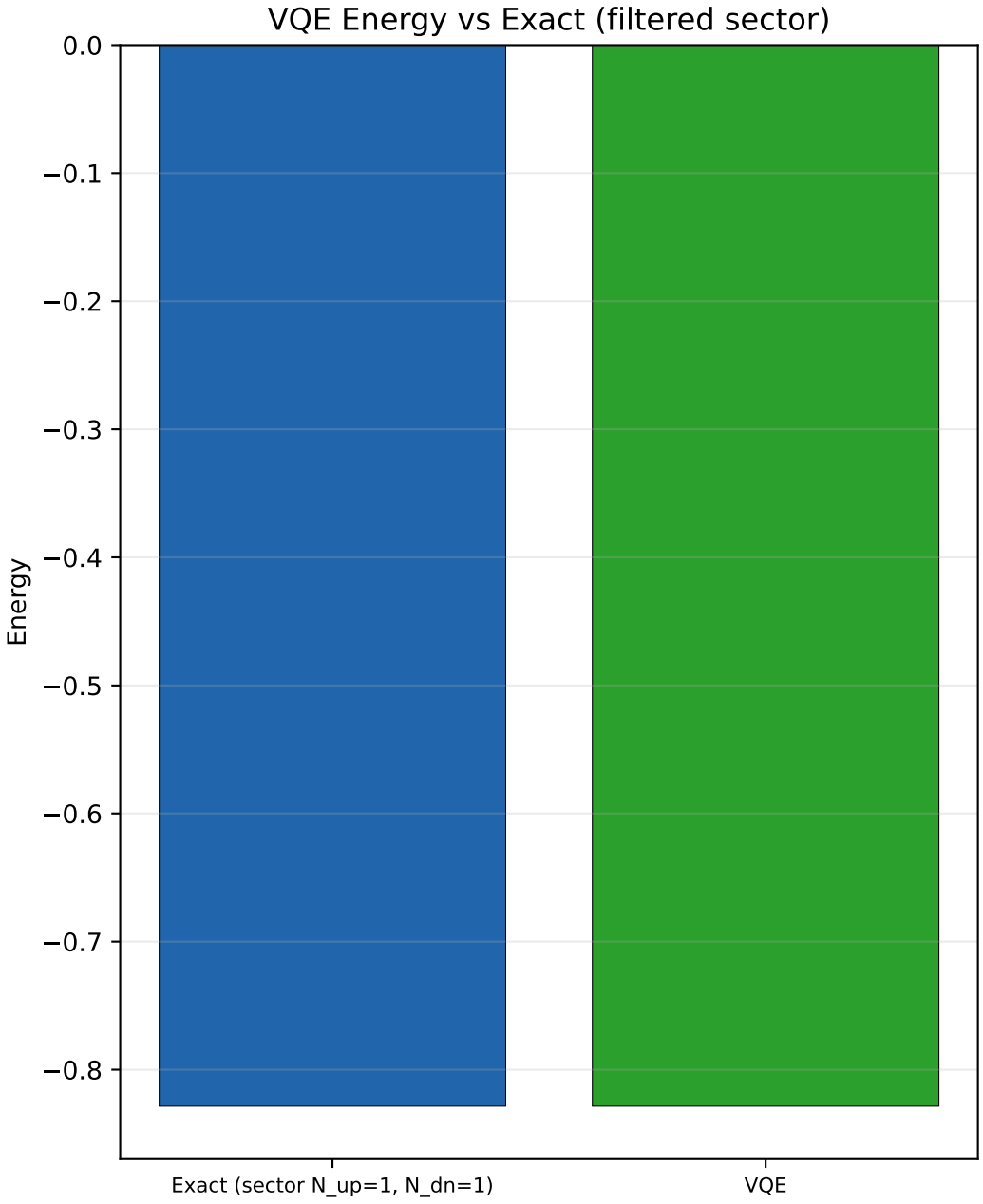


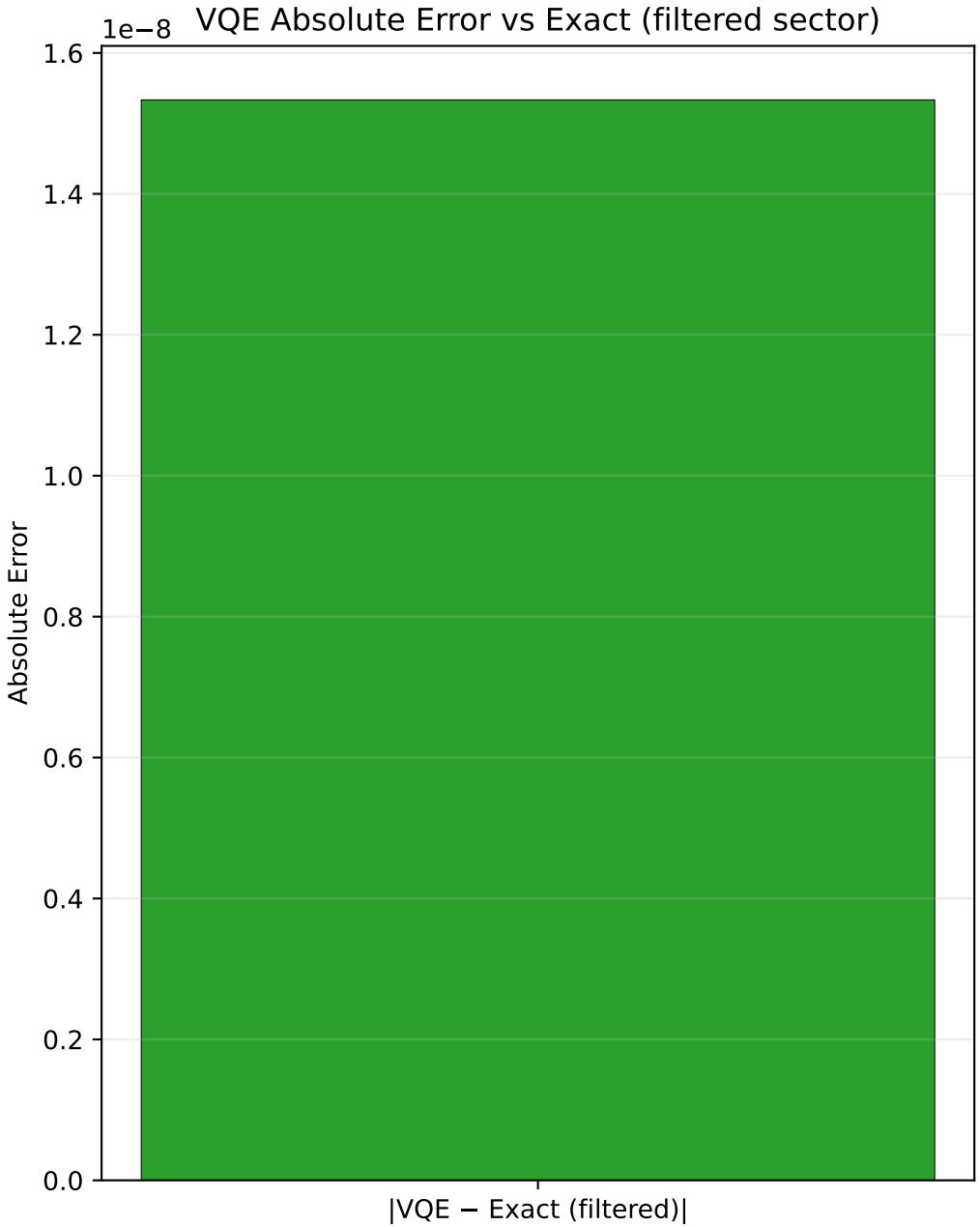






VQE optimises within the half-filled sector; exact (filtered) is the true sector ground state.
Full-Hilbert exact energy is in the JSON text summary only.





```
Hardcoded Hubbard pipeline summary

settings: {"L": 2, "t": 1.0, "u": 4.0, "dv": 0.0, "boundary": "periodic", "ordering": "blocked", "t_final": 20.0, "num_times":
exact_trajectory_label: Exact_Hardcode
exact_trajectory_method: python_matrix_eigendecomposition
ground_state_exact_energy (full Hilbert): -1.000000000000
ground_state_exact_energy_filtered: -0.8284271247461902
filtered_sector: {'n_up': 1, 'n_dn': 1}
vqe_energy: -0.828427109412792
qpe_energy_estimate: None
initial_state_source: exact
hamiltonian_terms: 11
reference_sanity: {'checked': False, 'reason': 'no matching bundled reference for these settings'}
```