

# SynQc: Temporal Dynamics Series — Executive Summary (v0.2)

\*\*Purpose:\*\* Establish a cross-hardware Drive–Probe–Drive (DPD) control framework with adaptive feedback and real-time Hamiltonian learning, verified pre-repository. \*\*Readiness Status:\*\* v0.2 Pre-Repo phase complete. No code yet. Analysis gates A–D defined. \*\*Scope Highlights:\*\* • Scheduler, probes, demod, adapt, hardware abstraction modules. • Synthetic plant with tunable SNR, drift, and jitter. • KPI guardrails for latency, convergence, and determinism. • Cross-hardware profiles: superconducting, trapped-ion, neutral-atom, photonic. • Cross-OS parity targets (Windows, macOS, Linux). \*\*Key Metrics (Targets):\*\* - DPD cycle  $\leq$  25 ms - Demod  $\leq$  3 ms - Convergence:  $\pm 2\%$  on  $\Delta$  and  $g$  within 200 cycles - Scheduler jitter  $\leq$  1 ms - Cross-OS parity = identical pass/fail \*\*Next Actions:\*\* 1. Run ProModel analysis using the Analysis Pack prompts. 2. Verify KPIs under synthetic plant scenarios. 3. Complete documentation & scoring rubric. 4. Open repository only after all gates A–D are green.

Gate	Name	Condition	Status
A	Design Freeze	Contracts + Synthetic plant locked	Pending
B	Simulation KPIs	All thresholds met across 4 profiles	Pending
C	Cross-OS Parity	Identical pass/fail outcomes	Pending
D	Docs Complete	Quickstart + KPI guardrails ready	Pending