RCS Circuits Are Weak

Why Random Circuit Sampling Falls Short and the PQST Advantage

Random Circuit Sampling (RCS) uses random gates to build supremacy benchmarks.
RCS circuits have no deterministic structure; they rely on randomness alone.

Weaknesses of RCS:
• No reproducible structure — each run is a new random circuit.
• No semantic or logical content — pure randomness.
• Cannot be generated by a fixed procedure without a random source.

PQST (Polycontextural Quantum Supremacy Test) advantage:
• Deterministic: context-driven phases and brickwork — no randomness required.
• Same statistical complexity as RCS at 64 qubits (identical HOP, entropy, unique outcomes).
• QPC generates supremacy-class circuits from polycontextural logic.

Conclusion: QPC can produce circuits with the same statistical power as RCS,
without randomness — a stronger, reproducible circuit generation paradigm.