Comparative Execution and Outcome Report

Document Scope. Compact execution-level reference summary of compiled circuit characteristics and distribution-based outcome metrics across execution modes, computed from raw measurement counts.

Execution metadata and compiled execution configuration. This table records the execution environment, compilation context, and immutable provenance information that define the reference frame for all subsequent measurements reported in this document.

	Execution Details
Date/Time	2025-10-10 16:05:39
Backend	ibm marrakesh
Avg T1 (μs)	195.92
Avg T2 (μs)	113.08
Avg Readout Error	2.49%

	Baseline	Conditioned
Qubit Count	15	15
Qubits Used	[Q0–Q14]	[Q0–Q14]
Shots	5,000	5,000
Transpiler	L3	L3
Job ID	`d3kn6oj4kkus739bud1g`	`d3kn6oj4kkus739bud20`

Compiled circuit structural metrics. This table reports circuit depth and gate-count characteristics obtained after compilation for each execution mode, providing a structural accounting of the executed circuits independent of measurement outcomes.

	Baseline	Conditioned	Δ(%)
Circuit Depth	71	97	+36.62%
Total Gate Count	161	260	+61.49%
Single Qubit Gates	56	135	+141.07%
Two Qubit Gates	29	43	+48.28%

Distribution-level statistical descriptors of measured outcomes. This table reports entropy, divergence, and moment-based metrics computed directly from the observed outcome probability distributions for each execution mode, without assuming an underlying state model.

	Baseline	Conditioned	Δ(%)
Entropy (bits)	4.183334	3.675333	−12.14
TVD (versus Ideal)	0.394200	0.329400	−16.44
Avg Hamming Weight	7.365600	7.247600	−1.60
Std Dev of State Probabilities	0.002394	0.002636	+10.11
Max State Probability	0.321200	0.348800	+8.59

Logical-manifold outcome probabilities and associated entropy measures. This table reports probabilities of selected logical-manifold outcomes and entropy-based aggregates computed from the measured outcome distributions for each execution mode.H_{near} and H_{far} denote Shannon entropies of the distributions conditioned on $d(x) \leq k$ and $d(x) > k$ respectively, with probabilities renormalized within each region.

Metric	Baseline	Conditioned	Δ(%)
$P(0^{15})$	0.3212	0.3488	+8.59
$P(1^{15})$	0.2846	0.3218	+13.07
P_{GHZ}	0.6058	0.6706	+10.70
$H(P)$ [bits]	4.1833	3.6753	−12.14
H_{near} [bits]	3.5076	3.0701	−12.47
$H_($far) [bits]	7.0511	5.9468	−15.66

Distance-resolved outcome structure relative to the logical manifold. This table reports conditional probabilities and entropy measures computed from measured outcomes partitioned by Hamming distance from a predefined logical manifold for each execution mode.

Metric	Baseline	Conditioned	Δ(%)
$P(d \leq 2)$	0.9214	0.9242	+0.30
$P(d > 2)$	0.0786	0.0758	-3.56
$P_{\text{GHZ}\mid d\leq 2}$	0.6575	0.7256	+10.36
Near-leakage fraction $1 - P_{\text{GHZ}\mid d\leq 2}$	0.3425	0.2744	-19.89
$H^{(d)}_{\text{near}}$ [bits]	1.1707	1.0308	-11.95

Distribution concentration, normalization, and inter-mode divergence metrics. This table reports rank-ordered concentration measures, low-distance leakage mass, burden-normalized quantities, and distributional divergence metrics computed from measured outcomes to facilitate comparative characterization across execution modes.

Metric	Baseline	Conditioned	Δ(%)
$P_{\text{top-4}}$	0.6618	0.7114	+7.49
$P_{\text{top-8}}$	0.7252	0.7640	+5.35
$P_{\text{top-16}}$	0.7946	0.8312	+4.61
Leakage mass $d = 1$	0.2542	0.2094	−17.62
Leakage mass $d = 2$	0.0614	0.0442	−28.01
P_{GHZ}/depth	0.00853	0.00691	−18.97
P_{GHZ}/total gates	0.00376	0.00258	−31.45
P_{GHZ}/2q gates	0.02089	0.01560	−25.35
TVD(P, Q)	—	0.1506	—
JSD(P, Q) [bits]	—	0.0693	—