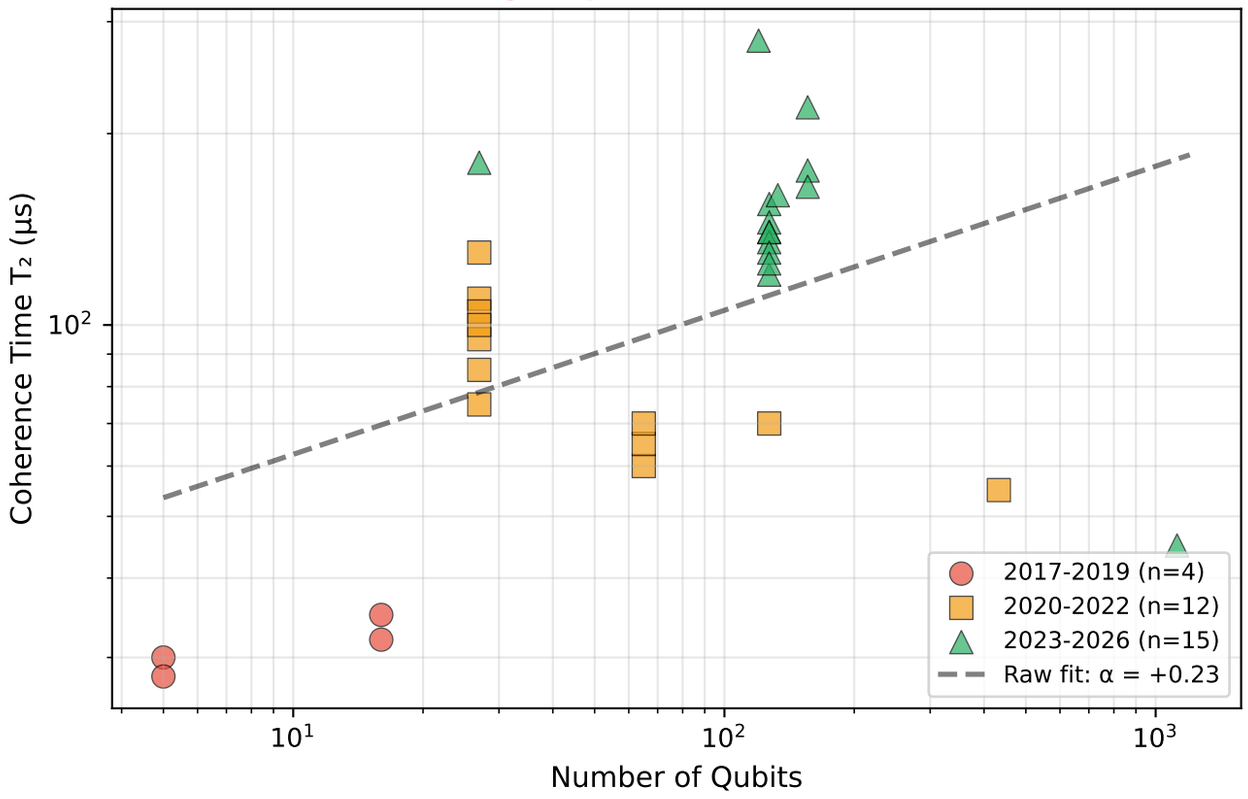

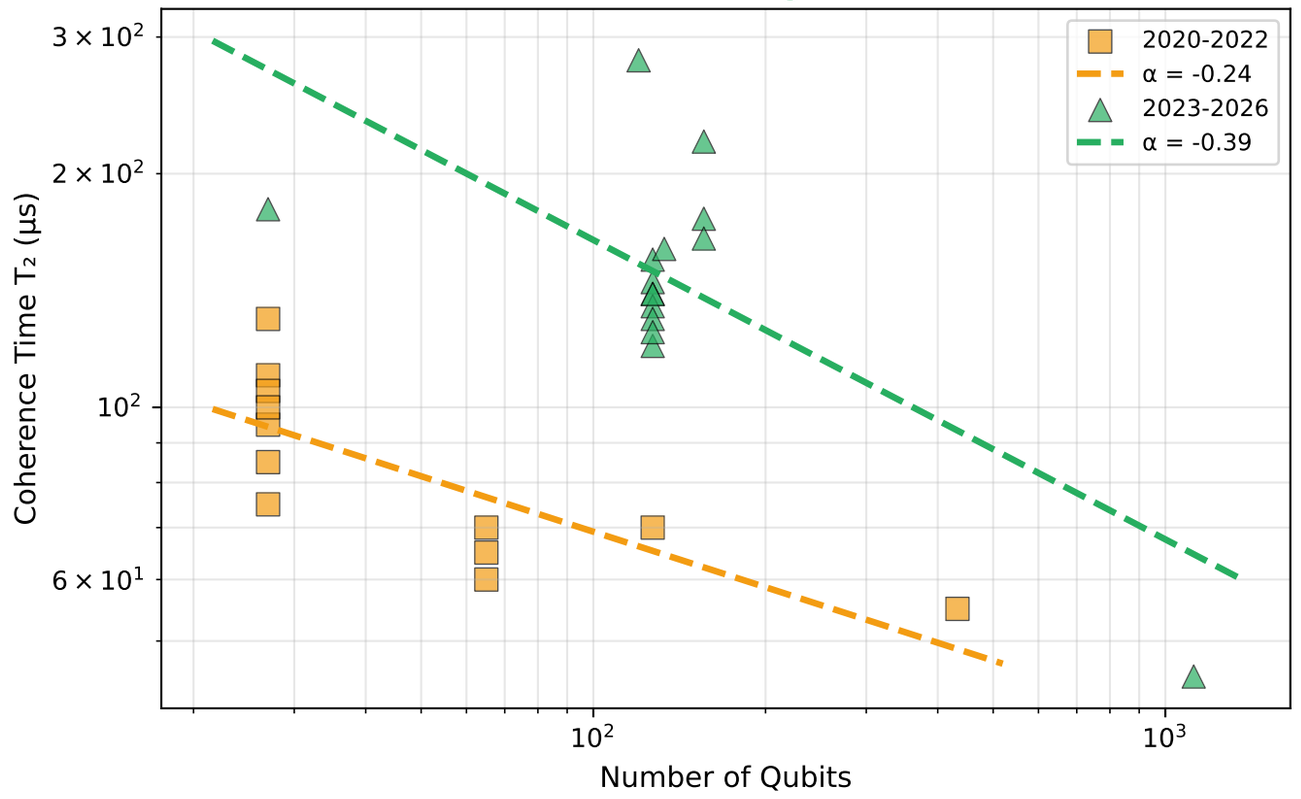

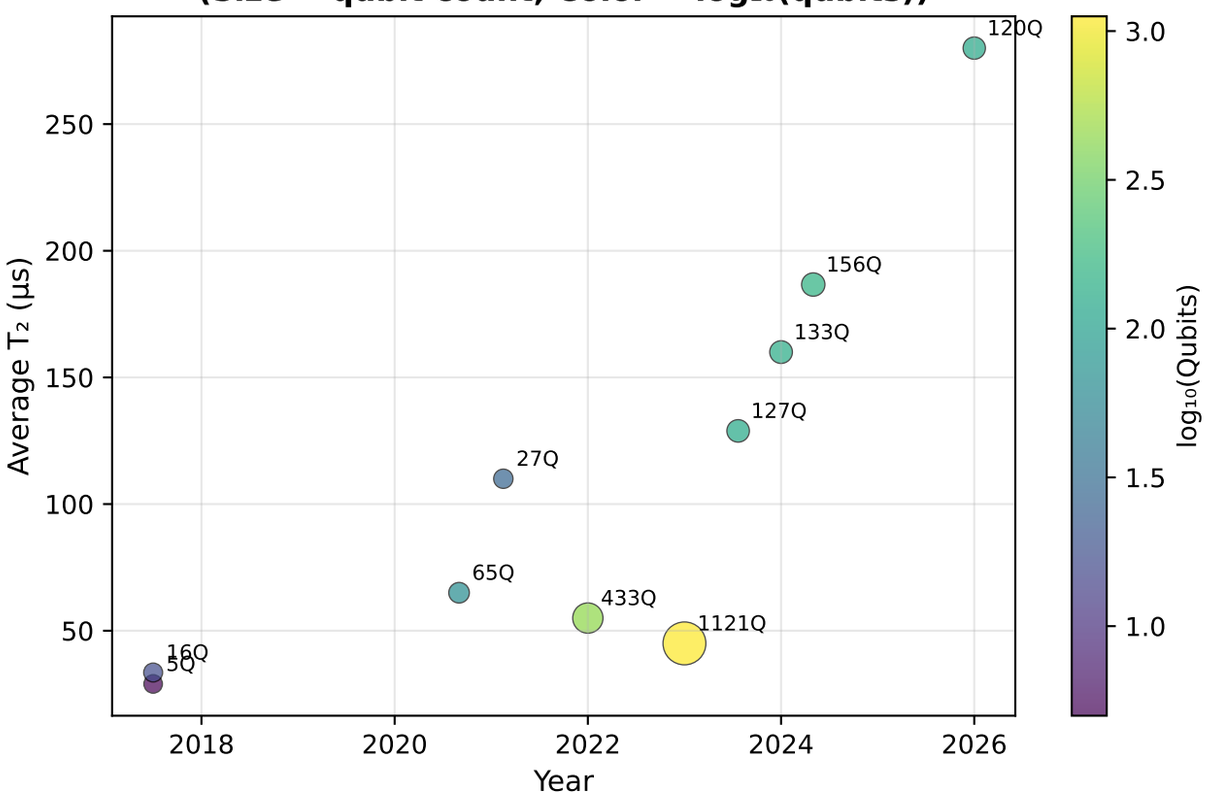


```
RTM QUANTUM DECOHERENCE ANALYSIS: IBM PROCESSORS

DATASET

• Processors analyzed: 31
• Qubit range: 5 - 1121
• T₂ range: 28 - 280 μs
• Time span: 2017 - 2026

KEY RESULTS

RAW SCALING (confounded):
α = +0.23 ± 0.08
→ Misleading! Technology improvements dominate

SAME-GENERATION SCALING (true effect):
2020-2022: α = -0.24 (n=12)
2023-2026: α = -0.39 (n=15)

→ TRUE α ≈ -0.3 to -0.4

PHYSICAL INTERPRETATION

• Negative α: Larger systems decohere FASTER
• Decoherence is COLLECTIVE, not independent
• Sources: crosstalk, correlated noise, TLS defects

RTM TRANSPORT CLASS: INVERSE/COLLECTIVE (α < 0)
• Similar to Stokes-Einstein diffusion (α = -1)
• System size works AGAINST coherence
• Each added qubit adds decoherence pathways

COMPARISON TO OTHER α < 0 SYSTEMS

• Stokes-Einstein (bulk diffusion): α = -1.19
• Quantum decoherence: α ≈ -0.35
• Both show: BIGGER = SLOWER/WORSE
```