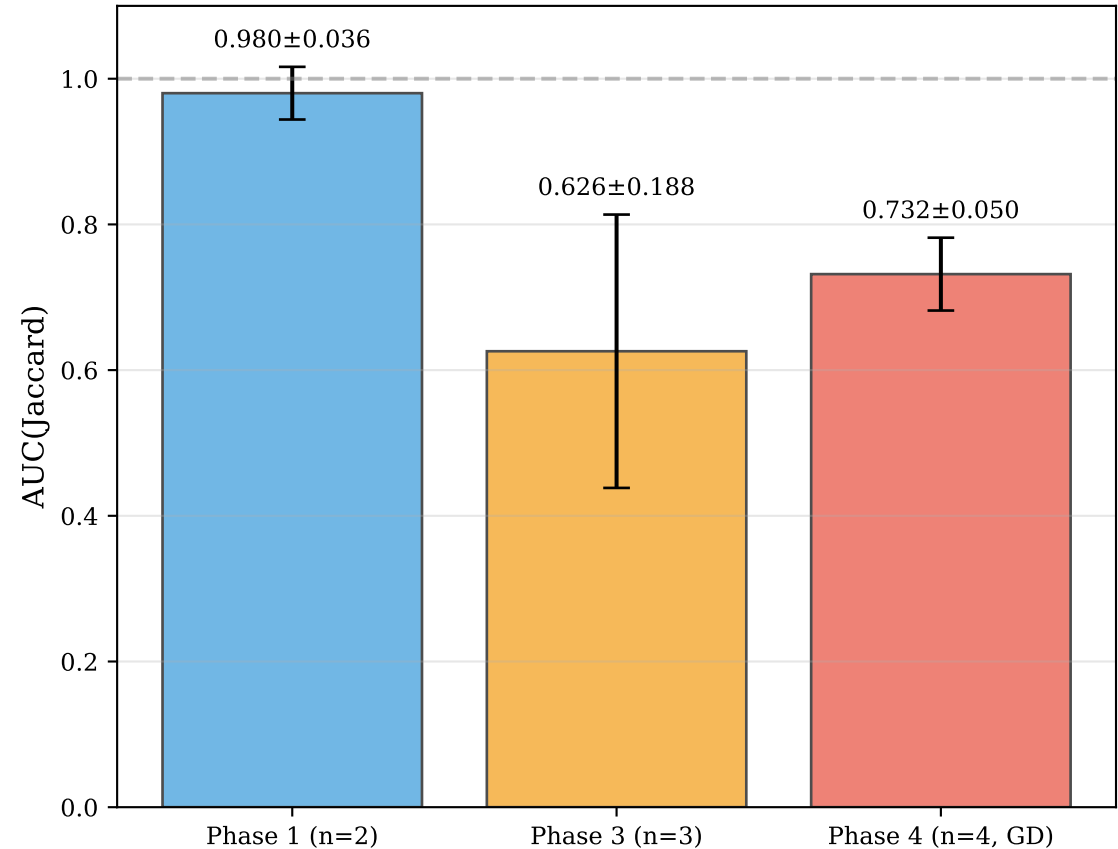
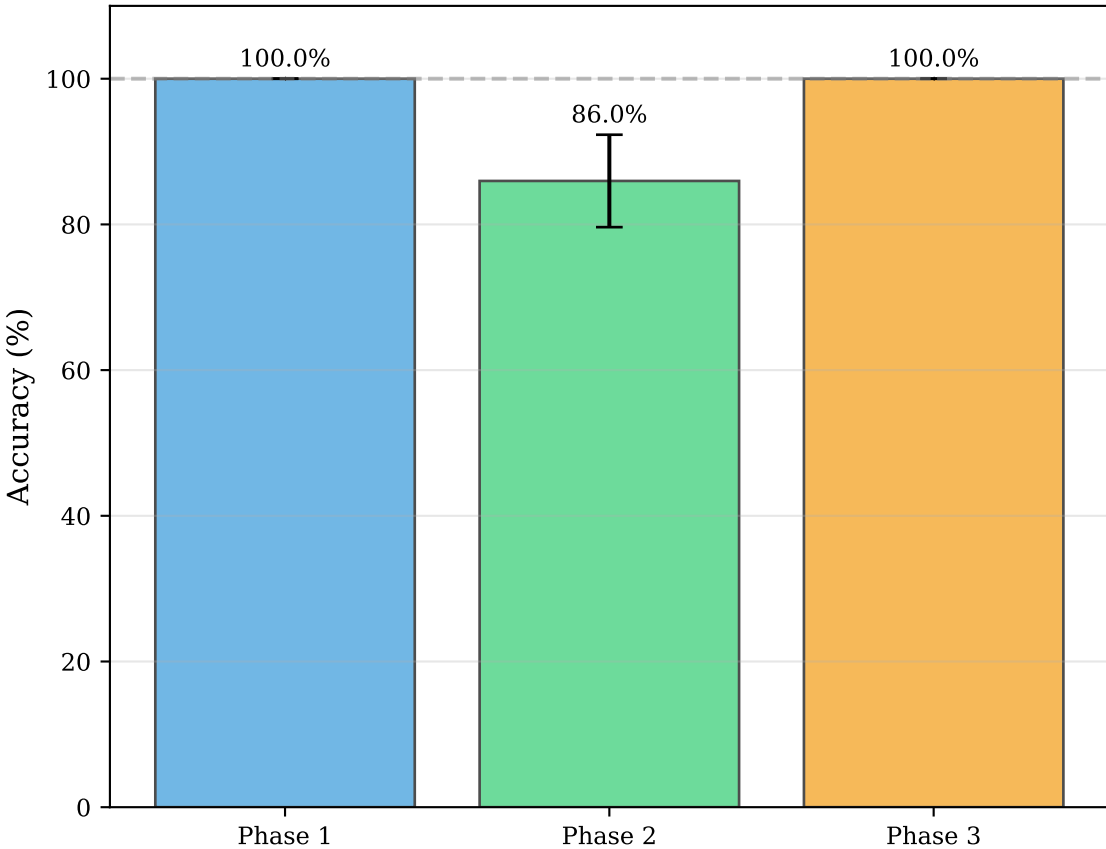


Unified Diagnostic Summary: Phases 1-4

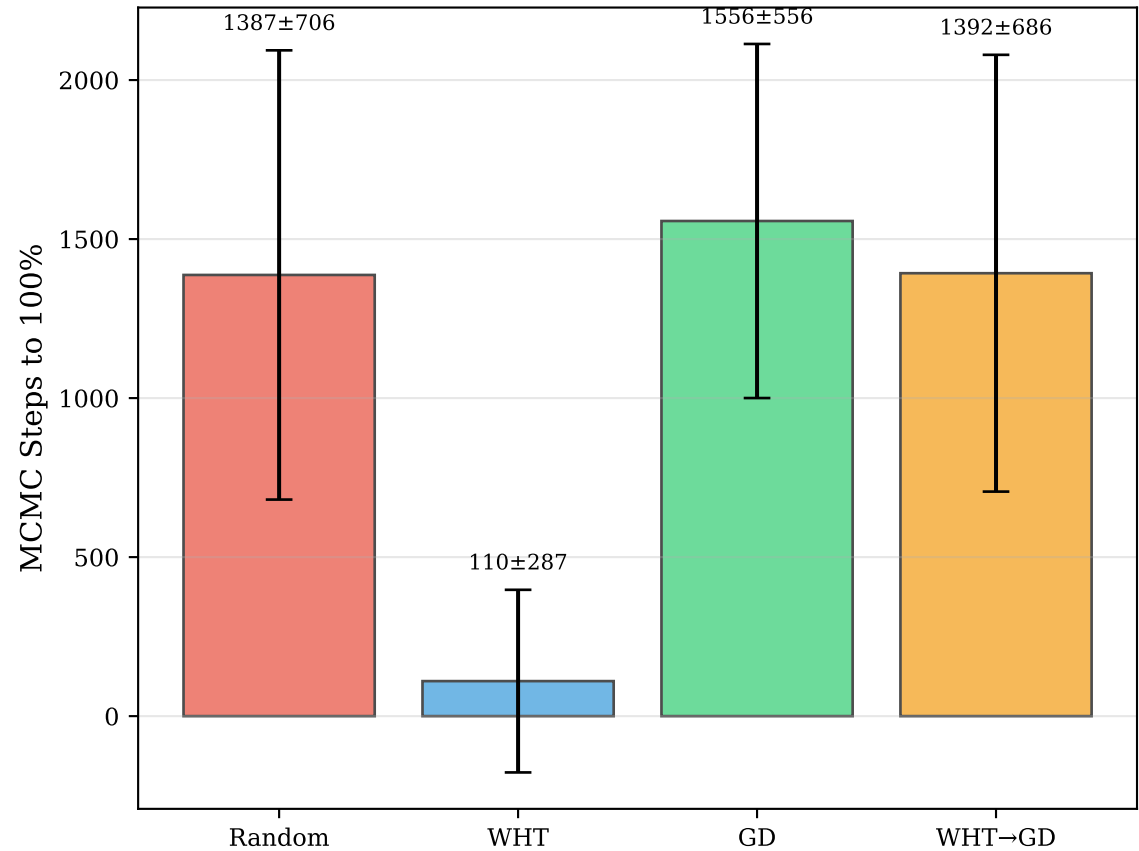
A) Topology Learning: AUC(Jaccard) Comparison



B) Final Accuracy



C) Phase 4: Warm-Start MCMC Convergence



Key Findings: "Topology First, Definition Second"

Phase 1 (n=2): Perfect Topology Learning

- AUC(Jaccard) = 0.980 ± 0.036
- GD learns correct support immediately
- 100% accuracy baseline

Phase 2 (Routing): Manifold Constraint Held

- Routing drift = 3.316 ± 0.111 (from uniform)
- mHC stability validated at scale (4→16 ops)
- Mean accuracy: 85.97% ± 6.34%

Phase 3 (n=3): Topology Despite Plateau

- AUC(Jaccard) shows GD learns support
- Accuracy plateaus but topology emerges
- Discrete refinement needed for 100%

Phase 4 (n=4): WHT Dominates Gradient Warm-Start

- WHT: 110 steps | Random: 1387 | GD: 1557
- WHT→GD: 1393 (no improvement over GD alone)
- Exact spectral analysis beats gradients at n=4
- Validates spectral synthesis pipeline