Classical IMHK vs Quantum Walk MCMC: Performance Comparison Convergence Rate Comparison Scaling with Dimension Classical IMHK d=1 Classical IMHK d=2 Classical IMHK d=3 10⁻¹ 10⁻¹ Classical IMHK d=4 Quantum Walk d=1 Quantum Walk d=2 Quantum Walk d=3 Quantum Walk d=4 Total Variation Distance 10⁻² Final TV Distance --- Classical σ=1.0 10⁻⁴ 10⁻⁴ Quantum σ=1.0 Classical σ=1.5 Quantum σ=1.5 Classical σ=2.0 Quantum σ=2.0 100 200 300 400 500 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 Iteration Lattice Dimension Convergence Rate by Method Resource Efficiency Comparison 0.025 Classical IMHK Classical IMHK Quantum Walk Quantum Walk 10¹ 0.020 Resource Efficiency 10⁰ 10⁻¹ 0.005 0.000 1.0 2.5 3.0 4.5 5.0 3 1.5 2.0 3.5 4.0 Lattice Dimension Lattice Dimension