

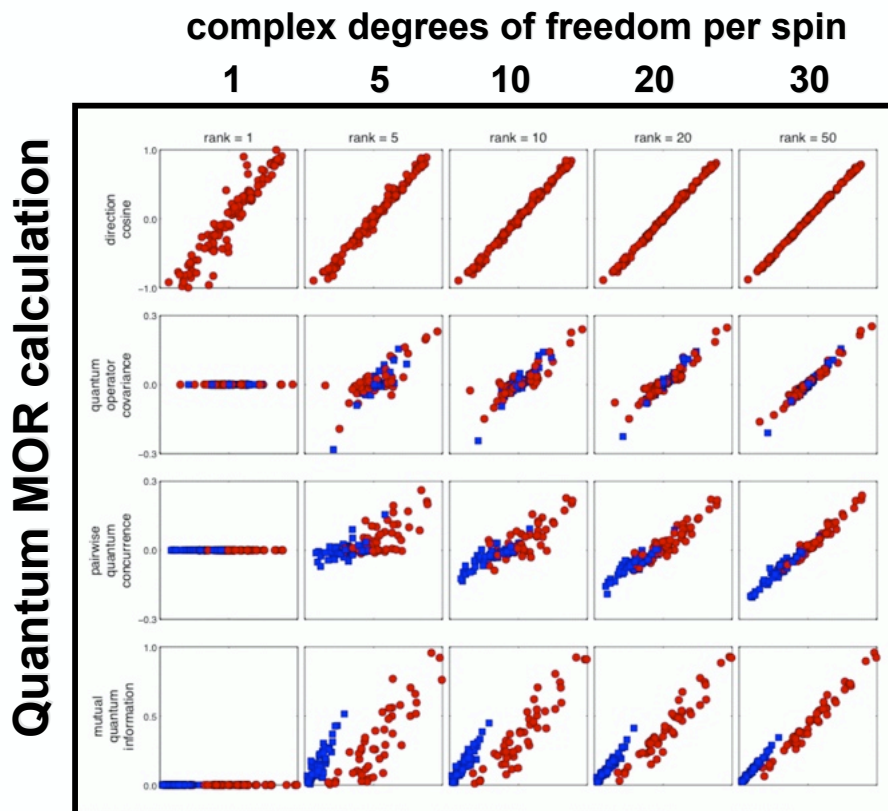
Q5: Are we confident that quantum spin microscopy will work?

A5.8: QMOR enables the “virtual rollouts” that are vital to modern industry

- For realistic molecular imaging, each spin effectively has ~ 30 quantum dynamical degrees of freedom
- Realistic spin simulations of (e.g.) large biomolecules will require tracking $\sim 10^6$ quantum degrees of freedom
- The resulting numerical complexity is comparable to large-scale simulations in fluid dynamics, combustion theory, control theory

• Large-scale MOR + virtual rollouts are vital to present industrial strategy: *aircraft, power generators, machine tools, jet engines, automobiles, VLSI*

• Large-scale QMOR + virtual rollouts are vital to future industrial strategy: *quantum microscopy, spintronics, smart materials, pharmaceuticals, actionable WMD biointelligence*



All-orders quantum calculation

