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Bringing Rydberg Atom Array Quantum Simulators Online[1]
KENT UENO, CAROLINE LAURE TCHOUAWOU MBAKOB, HO JUNE KIM, JEREMY FLANNERY, ALEXANDRE COOPER, Institute for Quantum Computing, University of Waterloo — Rydberg atom arrays based on alkali and alkaline-earth elements have recently emerged as a competitive platform for simulating quantum many-body systems formed by hundreds of interacting particles assembled in reconfigurable structures with tunable dimensionality, geometry, and interaction strengths. Democratizing access to such quantum simulators will impact not only quantum information science, but also condensed matter physics, e.g., by facilitating the exploration of Ising spin models and lattice gauge theories. In this poster, we outline our progress in bringing our first-generation rubidium-87 system online and describe our effort to develop a low-latency closed-loop feedback control system for calibrating and optimizing control parameters.

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