Simulation and Experiments with the cloud-accessible ultracold-matter hardware Oqtant

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This presentation introduces a cloud-accessible 87Rb-based ultracold atom platform, Oqtant, made available by Infleqtion. The platform provides a programmable means of producing and then manipulating ultracold matter using painted optical potentials. Experiments typically begin with the production of a Bose-Einstein condensate, then proceed by manipulating atomic potential through the distribution of laser light. The programming is done through Python programming. Oqtant is accompanied by simulation software that allows one to simulate dynamics on a classical computer, and then with the flip of a (software) switch, run the corresponding experiment. In addition to its educational value, Oqtant allows non-specialists to carry out meaningful ultracold matter experiments. We discuss present and possible future capabilities.

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