

Towards an experimentally feasible controlled-phase gate on two blockaded Rydberg atoms

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Reference:

arXiv:1111.6083v1

URL:

<http://arxiv.org/abs/1111.6083v1> [2]

We investigate the implementation of a controlled-Z gate on a pair of Rydberg atoms in spatially separated dipole traps where the joint excitation of both atoms into the Rydberg level is strongly suppressed (the Rydberg blockade). We follow the adiabatic gate scheme of Jaksch et al. [1], where the pair of atoms are coherently excited using lasers, and apply it to the experimental setup outlined in Gaetan et al. [2]. We apply optimisation to the experimental parameters to improve gate fidelity, and consider the impact of several experimental constraints on the gate success.

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