



UNIVERSITÀ  
DEGLI STUDI  
DI PADOVA

## Two-qubit CZ gate implementation with trapped neutral atoms: a numerical simulation

Alice Pagano

Mat. 1236916

[alice.pagano@studenti.unipd.it](mailto:alice.pagano@studenti.unipd.it)

Michele Puppin

Mat. 1227474

[michele.puppin@studenti.unipd.it](mailto:michele.puppin@studenti.unipd.it)

Quantum Information and Computing  
a.y. 2020/21

22 March 2021

### New protocol

- Two global laser pulses (with the laser phase of the second pulse shifted by  $\xi$ ) of the same length  $\tau$  and detuning  $\Delta$  couple  $|1\rangle$  to  $|r\rangle$  and drive nearby atoms within the Rydberg blockade regime.
- Neighboring atoms cannot be simultaneously excited to the Rydberg state according to the **Rydberg blockade**.

**Thank you for the  
attention!**