

Controlling Stray Electric Fields on an Atom Chip for Rydberg Experiments

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Reference:

arXiv:1710.05301

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<https://arxiv.org/abs/1710.05301> [2]

Experiments handling Rydberg atoms near surfaces must necessarily deal with the high sensitivity of Rydberg atoms to (stray) electric fields that typically emanate from adsorbates on the surface. We demonstrate a method to modify and reduce the stray electric field by changing the adsorbates distribution. We use one of the Rydberg excitation lasers to locally affect the adsorbed dipole distribution. By adjusting the averaged exposure time we change the strength (with the minimal value less than 0.2 V/cm at 78 μ m from the chip) and even the sign of the perpendicular field component. This technique is a useful tool for experiments handling Rydberg atoms near surfaces, including atom chips.

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