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Geometry and Acceleration Effects on Majorana Loss of Ultracold Atoms in a Hybrid Optical and Magnetic Trap[1] YAFAN DUAN, FENG CHENG, ZHEN XU, YUZHU WANG, Key Laboratory for Quantum Optics, Shanghai Institute of Optics and Fine Mechanics, TAO HONG, Shanghai Institute of Optics & Fine Mechanics, Shanghai Institute for Advanced Studies, Joint Quantum Inst. & Dept. of Physics, Univ. of Maryland — The precise control of a hybrid optical and magnetic trap makes it possible to investigate the effects of geometry and acceleration on Majorana loss of atoms caused by nonadiabatic spin flips. We experimentally investigate how geometry and acceleration affect the loss rate of the atoms in an anisotropic magnetic trap formed by thin wires on an atom chip. Combining with a far blue detuned one dimensional optical lattice, we investigate the sealing effect of the hole in the magnetic trap. In addition, we will also explore the possible application of this technique in guided atom interferometers and quantum simulation with one dimensional quantum gases.

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