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Anomalous and Spin Hall Insulator in A Fermionic Cold Atom Optical Lattice CHUANWEI ZHANG, Department of Physics and Astronomy, Washington State University, Pullman, WA 99163, JUNREN SHI, Institute of Physics, Chinese Academy of Science, Beijing, China, QIAN NIU, Department of Physics, University of Texas, Austin, Texas, 78712 — We construct a band insulator in a two dimensional fermionic cold atom optical lattice. The insulator has quantized anomalous Hall conductance and non-vanishing spin Hall coefficient. Although the spin Hall coefficient in the insulator is not quantized in general, it is extremely robust against disorder.

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