

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Extension of the Kitaev model on the square lattice RYOTA NAKAI, Department of Physics, The University of Tokyo, AKIRA FURUSAKI, Condensed Matter Theory Laboratory, RIKEN, SHINSEI RYU, Department of Physics, University of California at Berkeley — We study an extension of the Kitaev model [1] on the square lattice, where two types of Gamma matrices on neighboring sites have interaction that respects time reversal symmetry. A family of Kitaev models can be classified as the topological insulator/superconductor when described by Majorana fermions [2]. Our model is in class DIII in Altland-Zirnbauer classification, and thus a Z_2 invariant characterizes two distinct phases. There appear helical Majorana edge modes in the topological phase. The same model on the one-dimensional ladder is also studied.

[1] A. Kitaev, *Annals of Physics* 321, 2 (2006).

[2] S. Ryu, *Phys. Rev. B* 79, 075124 (2009).

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Date submitted: 23 Dec 2010

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