Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Fermion Fractionalization to Majorana Fermions in Dimerized Kitaev Superconductor RYOHEI WAKATSUKI, MOTOHIKO EZAWA, University of Tokyo, YUKIO TANAKA, Nagoya University, NAOTO NAGAOSA, University of Tokyo, RIKEN CEMS — We study theoretically a one-dimensional dimerized Kitaev superconductor model which belongs to BDI class with time-reversal, particle-hole, and chiral symmetries.[1] There are two sources of the particle-hole symmetry, i.e., the sublattice symmetry and superconductivity. Accordingly, we define two types of topological numbers with respect to the chiral indices of normal and Majorana fermions, which offers an ideal laboratory to examine the interference between the two different physics within the same symmetry class. Phase diagram, zero-energy bound states, and conductance at normal metal/superconductor junction of this model are unveiled from this viewpoint. Especially, the electron fractionalization to the Majorana fermions showing the splitting of the local density of states is realized at the soliton of the dimerization in this model.

[1]R. Wakatsuki, M. Ezawa, Y. Tanaka, and N. Nagaosa, Phys. Rev. B, **90**, 014505 (2014).

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Date submitted: 13 Nov 2014 Electronic form version 1.4