

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Hybrid Weyl Semimetal XI LUO, Department of Physics, Fudan University, FEI-YE LI, Institute of Theoretical Physics, Chinese Academy of Sciences, XI DAI, Institute of Physics, Chinese Academy of Sciences, YUE YU, Department of Physics, Fudan University, FAN ZHANG, Department of Physics, University of Texas at Dallas, GANG CHEN, Department of Physics, Fudan University — We construct a tight-binding model realizing one pair of Weyl nodes and three distinct Weyl semimetals. In the type-I (type-II) Weyl semimetal, both nodes belong to type-I (type-II) Weyl nodes. In addition, there exists a novel type, dubbed "hybrid Weyl semimetal", in which one Weyl node is of type-I while the other is of type-II. For the hybrid Weyl semimetal, we further demonstrate the bulk Fermi surfaces and the topologically protected surface states, analyze the unique Landau level structure and quantum oscillation, and discuss the material realization.

Fei-Ye Li
Chinese Academy of Sciences (CAS)

Date submitted: 11 Nov 2016

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