

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Chern mosaic: topology of chiral superconductivity in ferromagnetic adatom lattices¹ JOEL RONTYNEN, TEEMU OJANEN, Low Temperature Laboratory, Aalto University — Recent experiments have demonstrated signatures of Majorana bound states in ferromagnetic atomic chains. We show that similar systems, extended to two dimensional geometry, may support chiral topological superconductivity with large Chern numbers. Our observation is based on the fact that magnetic adatoms on an s-wave superconductor bind subgap Shiba states, which can hybridize and form subgap energy bands with nontrivial topology. Such a Shiba lattice supports long-range hopping, leading to a complex, mosaic-like phase diagram with large Chern numbers. We analyze the incidence of different Chern numbers phases and the size of their energy gaps for various lattice geometries. Our findings reveal the studied system as one of the richest platforms of topological matter known to date.

¹The authors acknowledge the Finnish Cultural Foundation and the Academy of Finland for support.

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Date submitted: 05 Nov 2015

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