Surface properties of chiral *d*-wave superconductor with hexagonal symmetry

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Abstract:
Surface properties are examined in a chiral d-wave ($d_{x^2-y^2}+id_{xy}$ -wave) superconductor with hexagonal symmetry, whose non-interacting part of Hamiltonian possesses the intrinsic spin-orbit coupling identical to one characterizing the topological nature of the Kane-Mele honeycomb insulator [1]. The spin-orbit coupling gives rise to the surface spin current spontaneously in the normal state, and the chiral pairing causes the surface charge current in addition. The combination of these two currents results in a surface spin polarization, and we find the significant difference of its spatial dependence in zigzag and armchair slabs [2]. The spin-resolved STS could test our scenario, i.e., be an additional probe for the chiral d-wave pairing in the staggered non-centrosymmetric superconductor SrPtAs [3].

References:
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