

Abstract Submitted
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Momentum-space spin texture of a topological superconductor¹

ARNO KAMPF, FLORIAN LODER, THILO KOPP, DANIEL BRAAK, Institutue of Physics, University of Augsburg, Germany — A conventional superconductor with spin-orbit coupling turns into a topological superconductor beyond a critical strength of the Zeeman coupling. The spin-expectation values $\mathbf{S}(\mathbf{k})$ in momentum space trace this transition via a characteristic change in the topological character of the spin texture within the Brillouin zone. At the transition the skyrmion counting number switches from 0 to 1/2 identifying the topological superconductor via its meron-like spin texture. The change in the skyrmion counting number is crucially controlled by singular points of the map $\mathbf{S}(\mathbf{k})/|\mathbf{S}(\mathbf{k})|$ from the Brillouin zone, i.e. a torus, to the unit sphere. The complexity of this spin-map is discussed at zero temperature as well as for the extension to finite temperatures.

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