Weak antilocalization and one-dimensional topological states in the layered SnTe systems

W. Brzezicki[1,2]

[1] *Institute of Theoretical Physics, Jagiellonian University, Cracow*
[2] *International Research Center MagTop, Institute of Physics PAS, Warsaw*

Inspired by the study of topological properties of multilayer SnTe systems with atomic steps [1], we have studied quantum effects in magnetotrasport for such type of systems [2]. The weak (anti)localization is an interference effect of closed scattering paths that results in (increase)decrease of the conductance with respect to the classical value and its (decrease)increase in external magnetic field with respect to zero field value. We have successfully related this value to the Berry phase of Fermi cross-sections to explain the measurement in the perpendicular magnetic field and we have adopted the calculation of the so-called Cooperon correlator in the parallel field. Finally, topologically non-trivial states were also found in the tight-binding model of the SnTe nanowire. These include both end- and hinge- states in the normal state as well as Majorana end-states in the superconducting phase.

References:

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I acknowledge the support by Narodowe Centrum Nauki (NCN, National Science Centre, Poland) Project No. 2019/34/E/ST3/00404. The International Research Center MagTop is supported by the Foundation for Polish Science through the IRA Programme co-financed by EU within SG OP (Grant No. MAB/2017/1).