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Signatures of Majorana zero-modes in nanowires, quantum spin Hall edges, and quantum dots

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List of Publications

1. *Size effect of Ruderman-Kittel-Kasuya-Yosida interaction mediated by electrons in nanoribbons*, Shuo Mi, Shuo-hong Yuan, and Pin Lyu, *J. Appl. Phys.* **109**, 083931 (2011).
2. *Proposal for the detection and braiding of Majorana fermions in a quantum spin Hall insulator*, Shuo Mi, D. I. Pikulin, M. Wimmer, and C. W. J. Beenakker, *Phys. Rev. B* **87**, 241405(R) (2013). [Chapter 3]
3. *Wigner-Poisson statistics of topological transitions in a Josephson junction*, C. W. J. Beenakker, J. M. Edge, J. P. Dahlhaus, D. I. Pikulin, Shuo Mi, and M. Wimmer, *Phys. Rev. Lett.* **111**, 037001 (2013).
4. *Disorder and magnetic-field induced breakdown of helical edge conduction in an inverted electron-hole bilayer*, D. I. Pikulin, T. Hyart, Shuo Mi, J. Tworzydło, M. Wimmer, and C. W. J. Beenakker, *Phys. Rev. B* **89**, 161403(R) (2014); *Erratum Phys. Rev. B* **89**, 199901 (2014). [Chapter 4]
5. *X-shaped and Y-shaped Andreev resonance profiles in a superconducting quantum dot*, Shuo Mi, D. I. Pikulin, M. Marciiani, and C. W. J. Beenakker, *JETP* **119**, 1018–1027 (2014). [Chapter 5]
6. *Single fermion manipulation via superconducting phase differences in multi-terminal Josephson junctions*, B. van Heck, Shuo Mi, and A. R. Akhmerov, *Phys. Rev. B* **90**, 155450 (2014). [Chapter 6]
7. *Impact of the soft induced gap on the Majorana zero-modes in semiconducting nanowires*, Shuo Mi, A. R. Akhmerov, and M. Wimmer, in preparation. [Chapter 2]

Curriculum Vitæ

I was born in Beijing, China, on June 24th 1983, where I completed my primary, secondary, and high school education.

I then continued my undergraduate and master study at the College of Physics of Jilin University, Changchun, China. My bachelor thesis “Self-assembly process of branched block liquid crystal copolymers and a prospect view from system dynamics” was performed under supervision of Prof. Cheng-Xiang Zhang. In September 2008, I joined the research group of Prof. Pin Lyu for a master program in condensed matter theory and obtained a Master degree of Science with honors in July 2011 with thesis title “RKKY Magnetic Interaction in Nanostructures”.

In the autumn of 2011, I received an opportunity to pursue my doctoral research in the group of Prof. C. W. J. Beenakker with a scholarship supported by China Scholarship Council (CSC) and Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO) under the program of “Talent and Training China-Netherlands” (T&T) in cooperation with Casimir Research School. I benefited a lot from the discussions with my group members and fellows from the Instituut-Lorentz in Leiden and the Kavli Institute of Nanoscience in Delft.

During my PhD years, I was a teaching assistant for the undergraduate course “Inleiding Fysica vaste stof” (Introduction to Solid State Physics) with Prof. H. Schiessel. I attended summer schools in Windsor, Les Houches, and Copenhagen, a winter school in Jerusalem, and other workshops and conferences. I presented my work in the United Kingdom, France, Germany, Russia, Denmark, and the Netherlands.