On the random-matrix theory of Majorana fermions in topological superconductors

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Stellingen

behorende bij het proefschrift
"On the random-matrix theory of Majorana fermions in topological superconductors"

1. Unlike the conductance, the density of states of a superconducting quantum dot with ballistic contacts cannot be used to detect a Majorana zero-mode.

   Chapter 2

2. In the chiral ensembles, the time-delay matrix contains more information about the number of Majorana zero-modes than the scattering matrix. In the Altland-Zirnbauer ensembles the opposite holds.

   Chapter 3

3. The thermal conductance of a superconducting quantum dot depends on the presence or absence of a Majorana zero-mode unless at least one of the scattering channels is coupled ballistically to the quantum dot.

   Chapter 4

4. When antisymmetric exchanges are negligible and transversal anisotropies small, the low-temperature magnetization stability of multiatom nanomagnets is determined by the symmetries, the spin magnitudes and the signs of the exchange terms.

   Chapter 5

5. The statistics of the compressibility of a chaotic Andreev billiard is not universal.

6. The attractor and repeller found by Gerasimenko *et al.* in non-linear 1D quantum walks must also be present if a (sign-definite) space dependence of the coefficient in front of the non-linear term is allowed.

   Y. Gerasimenko, B. Tarasinski, and C. W. J. Beenakker,
   Phys. Rev. **A** 93, 022329 (2016).

7. Particle-hole entanglement can be detected via Bell inequalities if one uses Andreev reflection to rotate the Nambu pseudospin.

8. The protection of some magnetized adatoms with half-integer spin from Kondo-assisted tunnelling, predicted by Prada, stems from a mistaken anticommutation in equation (14).

   M. Prada, arXiv:1605.03371.

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