Dirac and Majorana edge states in graphene and topological superconductors

Akhmerov, A.R.

Stellingen

behorende bij het proefschrift

Dirac and Majorana edge states in graphene and topological superconductors

1. The zigzag boundary condition applies generically to any orientation of the boundary of a graphene sheet.

   Chapter 2

2. The conductance of a zigzag nanoribbon in graphene depends on the parity of the number of carbon atom chains.

   Chapter 4

3. Thermal excitations do not degrade the coherence of isolated Majorana fermions.

   Chapter 6

4. When an electron has to split into two Majorana fermions, it splits evenly.

   Chapter 8

5. The topological phase of a system can be determined from its Fermi level properties, without requiring knowledge of the entire spectrum.

   I. C. Fulga, F. Hassler, A. R. Akhmerov, and C. W. J. Beenakker,
   Phys. Rev. B **83**, 155429 (2011)

6. The conductance of a ballistic quantum point contact attached to a topological superconductor is quantized at half-integer values of the conductance quantum.

   M. Wimmer, A. R. Akhmerov, J. P. Dahlhaus, and C. W. J. Beenakker,
   arXiv:1101.5795

7. In a superconducting wire topological charge equals electrical charge (modulo $2e$).

   F. Hassler, A. R. Akhmerov, and C. W. J. Beenakker, arXiv:1105.0315

8. The established algorithm of recursive Green's functions can be accelerated by an order of magnitude using the method of nested dissection.

9. In modern society the value of an original is inflated.

Anton Roustiamovich Akhmerov
31 May 2011

Stellingen

behorende bij het proefschrift

Dirac and Majorana edge states in graphene and topological superconductors

1. The zigzag boundary condition applies generically to any orientation of the boundary of a graphene sheet.

   Chapter 2

2. The conductance of a zigzag nanoribbon in graphene depends on the parity of the number of carbon atom chains.

   Chapter 4

3. Thermal excitations do not degrade the coherence of isolated Majorana fermions.

   Chapter 6

4. When an electron has to split into two Majorana fermions, it splits evenly.

   Chapter 8

5. The topological phase of a system can be determined from its Fermi level properties, without requiring knowledge of the entire spectrum.

   I. C. Fulga, F. Hassler, A. R. Akhmerov, and C. W. J. Beenakker,
   Phys. Rev. B **83**, 155429 (2011)

6. The conductance of a ballistic quantum point contact attached to a topological superconductor is quantized at half-integer values of the conductance quantum.

   M. Wimmer, A. R. Akhmerov, J. P. Dahlhaus, and C. W. J. Beenakker,
   arXiv:1101.5795

7. In a superconducting wire topological charge equals electrical charge (modulo $2e$).

   F. Hassler, A. R. Akhmerov, and C. W. J. Beenakker, arXiv:1105.0315

8. The established algorithm of recursive Green's functions can be accelerated by an order of magnitude using the method of nested dissection.

9. In modern society the value of an original is inflated.

Anton Roustiamovich Akhmerov
31 May 2011