On localization of Dirac fermions by disorder

Medvedyeva, M.V.

Stellingen

behorende bij het proefschrift

On localization of Dirac fermions by disorder

1. The phase diagram of a chiral p-wave superconductor has a *repulsive* tricritical point.

   This thesis, Chapter 2.

2. A sheet of graphene with a spatially varying band gap has no metallic phase.

   This thesis, Chapter 3.

3. Unlike the electrical quantum Hall effect, the thermal quantum Hall effect is destroyed by strong impurity scattering.

   This thesis, Chapter 4.

4. The transmission probability of nodal fermions in a d-wave superconductor is unaffected by intra-node scattering.

   This thesis, Chapter 5.

5. A magnetic field can increase the tunnelling probability of an electron by an order of magnitude.

   M. V. Medvedyeva, I. A. Larkin, S. Ujevic, L. N. Shchur, and B. I. Ivlev, Phys. Rev. B **78**, 165325 (2008).

6. The transmission time over a distance L of massless electrons (having velocity v) in undoped graphene equals $0.9L/v$.

   R. A. Sepkhanov, M. V. Medvedyeva, and C. W. J. Beenakker, Phys. Rev. B **80**, 245433 (2009).

7. The Josephson effect in graphene can coexist with the quantum Hall effect if the superconducting electrodes are narrower than the magnetic length.

8. The gauge-gravity (AdS/CFT) duality suggests a purely geometric mechanism for superconductivity, not mediated by any quasiparticle.

9. Using only the front part of the foot when running both prevents and cures knee injuries.
10. Creativity can be easily reduced by applying pressure.

Mariya Medvedyeva,
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