

Spin and orbital polarizations of conductance of the carbon nanotube quantum dot in the presence of Majorana Fermion in topological superconductor

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Conductance of carbon nanotube quantum dot (CNTQD) coupled to a pair of normal electrodes (N-QD-N) or to normal lead and topological superconductor (N-QD-TS) is studied in the Kondo range using Kotliar Ruckenstein slave bosons approach. Gate-dependent spin-orbit interaction (SOI) in CNTQD lowers the SU(4) symmetry of Kondo state to SU(2) symmetry and spin-orbital polarizations arise. The helical Majorana zero mode at the ends of topological superconductor filters selectively only one spin-orbital contribution of the Andreev conductance. For strong SOI and for weak coupling of the dot with topological superconductor, spin-orbital polarizations of conductance of N-QD-TS reproduce with a good accuracy spin-orbital polarizations of N-QD-N.

This project was supported by the Polish National Science Centre from the funds awarded through the decision No. DEC-2013/10/M/ST3/00488.