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Tunneling conductance in a graphene based normal-insulator-superconductor junction with Corbino disk structure

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Abstract

We study tunneling conductance of a graphene based normal metal-insulator-superconductor (NIS) junction with Corbino disk structure. Solving Dirac-Bogolioubov- De Gennes (DBdG) equation in different regions of the junction and employing scattering approach we obtain normal and Andreev reflection coefficients of the junction. Using Blonder-Tinkham-Klapwijk (BTK) formula we calculate tunneling conductance of the junction as a function of the barrier strength of insulating region. The obtained results show that tunneling conductance of the junction oscillates as a function of the barrier strength as in the planar structure case. The tunneling conductance shows maximums at resonances which have a $\pi/2$ phase shift with respect to the planar structure.

Keywords: graphene, tunneling conductance, superconductor, corbino disk, Andreev reflection, thin barrier

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