Naoum Karchev, J Phys Chem Biophys 2018, Volume 8
DOI: 10.4172/2161-0398-C1-028

Verification of Cooper pairing prior to superconductivity, applying electric field

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I report the first study for the impact of the applied electric field on the Cooper pairs prior the superconductivity. The generalized Maxwell equations are obtained from time-dependent Ginzburg-Landau theory using the first-order formalism in gauge theory. This formalism is very useful but not popular among solid-state physicists. This is why I gave more details in the derivation. The results give new insight for the electrodynamics of s-wave superconductors. It is shown that if there are Cooper pairs above the superconductor critical temperature, the electric field forces the Cooper pairs to Bose condensate and the onset of the superconductivity, thereby increasing the critical temperature.

Biography

Naoum Karchev has completed his PhD from Steklov Mathematical Institute Moscow and Post-doctoral studies from Sofia University, Department of Physics. He has published 47 papers in *Physical Review Letters, Physical Review B: Condensed Matter and Materials Physics, Physical Review D, Journal of Physics: Condensed Matter, etc.*

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