

Type-1.5 superconductivity

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Abstract:

Superconductivity is a state where electric charge flows without resistance. In Type-I and Type-II superconductors the charge flow patterns are dramatically different. Type I was discovered a century ago. In response to a weak magnetic field it creates a supercurrent near its surface and expels the applied magnetic field from its interior. Type II superconductivity was experimentally discovered by Shubnikov in 1937. Applied magnetic field can gradually penetrate this type of superconductors. In mid-1950, A.A.Abrikosov explained type-II behavior as a formation of a regular lattice of quantum vortices. In this talk, I will argue that because of some newly discovered and theoretically discussed materials, type-I/type-II classification of superconductors may be insufficient although this classification scheme was proven extraordinarily robust in the last 50 years. I will discuss a superconducting states which was termed "type-1.5" recently which breaks the type-I/type-II dichotomy.