

Superconductor – Insulator Transition in a non-Fermi Liquid

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Abstract:

We present a model of a strongly correlated system with a non-Fermi liquid high temperature phase. Its ground state undergoes an insulator to superconductor quantum phase transition (QPT) as a function of a pairing interaction strength. Both the insulator and the superconductor are originating from the same interaction mechanism. The resistivity in the insulating phase exhibits the activation behavior with the activation energy, which goes to zero at the QPT. This leads to a wide quantum critical regime with an algebraic temperature dependence of the resistivity. Upon raising the temperature in the superconducting phase, the model exhibits a finite temperature phase transition to a Bose metal phase, which separates the superconductor from the non-Fermi liquid metal.

