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Quantum Criticality of $3+1$-dimensional massless Dirac fermions[1]
SUDIP CHAKRAVARTY, University of California Los Angeles, PALLAB GOSWAMI, Rice University — We have studied the quantum critical behavior of $3+1$- dimensional massless Dirac fermions in the presence of long- range Coulomb interaction and random chemical potential using renormalization group analysis. We have addressed the stability of noninteracting fixed point and scaling properties of various physical quantities. The possibility of observing critical scaling phenomena in $Bi_{0.96}Sb_{0.04}$, $Pb_{1-x}Sn_xTe$, and $Hg_{1-x}Cd_xTe$ is discussed.

[1]NSF/DMR

Pallab Goswami
Rice University

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