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Title

The Application of Extended Sachdev-Ye-Kitaev (SYK) Model in Condensed Matter Physics

Abstract

As an example of gauge field/gravitational field microscopically correspondence, SYK model provides a tool for understanding the strongly-correlated electron systems. We generalized SYK model and made some progress on condensed matter physics. The complex SYK model with a conserved $U(1)$ fermion number and a conjugate chemical potential is investigated. The diffusive properties are qualitatively similar to strange metal. The lattice model for strongly interacting electrons motivated by a rank-3 tensor model is also investigated. Within the framework of this SYK-like model, Our results may pave the way to gaining insight into the pairing mechanism of high-temperature superconductivity.