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Study of 3-dimensional $SU(2)$ gauge theory with adjoint Higgs as a model for cuprate superconductors

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We study a 3-dimensional $SU(2)$ gauge theory with 4 Higgs fields which transform under the adjoint representation of the gauge group, that has been recently proposed by Sachdev et al. to explain the physics of cuprate superconductors near optimal doping. The symmetric confining phase of the theory corresponds to the usual Fermi-liquid phase while the broken (Higgs) phase is associated with the interesting pseudogap phase of cuprates. We employ the Hybrid Monte-Carlo algorithm to study the phase diagram of the theory. We find the existence of a variety of broken phases in accordance with earlier mean-field predictions and discuss their role in cuprates.

Topical area

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