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Dynamic mean field theory of the Gutzwiller-projected BCS Hamiltonian: phase fluctuation and pseudogap KWON PARK, Korea Institute for Advanced Study — One of the most prominent problems in high temperature superconductivity is the nature of the pseudogap phase in the underdoped regime and its relationship to phase fluctuations. In this context, the Gutzwiller-projected BCS Hamiltonian is a useful model especially suited for the study of high temperature superconductivity in the underdoped regime due to the fact that there is an exact mapping to the Heisenberg model at half filling and a close connection to the t-J model at low doping in general. To be concrete, we have developed a dynamic mean field theory of the d-wave BCS Hamiltonian with on-site repulsion U. The large U limit corresponds to the Gutzwiller- projected BCS Hamiltonian. Effects of the phase fluctuations are studied as a function of on-site repulsion U and doping x.

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