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Sublattice model of atomic scale pairing inhomogeneity in a superconductor VIVEK MISHRA, P.J. HIRSCHFELD, Department of Physics, University of Florida, Gainesville, FL 32611, YURI S. BARASH, Institute of Solid State Physics, Russian Academy of Sciences, Chernogolovka, Moscow reg., 142432, Russia — We study a toy model for a superconductor on a bipartite lattice, where intrinsic microscopic inhomogeneity is produced by two different pairing coupling constants on each sublattice. We consider effects of the inhomogeneity on the transition temperature, the density of states, the specific heat and superfluid density in the framework of the Bogoliubov-de Gennes equations, which may be solved analytically in several interesting cases. The phase diagram in the plane of two pairing coupling constants is found to include a state of gapless superconductivity.

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