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Two component Coulomb glass in disordered superconducting films JOE MITCHELL, ANIRBAN GANGOPADHYAY, VICTOR GALITSKI, University of Maryland, College Park, MARKUS MUELLER, The Abdus Salam International Center for Theoretical Physics — We propose a new two component Coulomb glass model which includes strong disorder, Coulomb interaction, and on-site electron pairing to investigate the effects of localized pairing in disordered films on the insulating side of a superconductor-insulator transition. In particular, we show how the density of states (DOS) changes with increasing on-site coupling between electrons, from an Efros-Shklovskii linear DOS for the electrons at weak coupling, to a strongly modified, non-monotonic DOS with nonuniversal Coulomb gap for electrons and on-site pairs at moderate coupling, and finally to an Efros-Shklovskii linear DOS for pairs at strong coupling. We discuss the effects of a spatially random coupling. We use a Miller Abrahams resistor network mapping to numerically calculate resistance for samples of this model, given temperature and localization length. With certain parameter choices, we can obtain a peak in resistance with respect to magnetic field, reminiscent of magnetoresistance peaks reported experimentally.

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