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Strong correlations lead to protected low energy excitations in disordered d-wave superconductors ARTI GARG, Technion, Israel Institute of Technology, MOHIT RANDERIA, NANDINI TRIVEDI, The Ohio State University — We show that strong correlations play a vital role in protecting low energy excitations in disordered high temperature superconductors. The impurity-induced low-energy density of states (DOS) is greatly reduced in the strongly correlated superconductor compared to d-wave Bogoliubov-deGennes theory which ignores strong correlations. The gapless nodal quasiparticles, and the resulting ‘V’ in the low-energy DOS, are much more robust against disorder compared to the large-gap antinodal excitations. We discuss the relevance of our results to angle-resolved photoemission and scanning tunneling spectroscopy experiments. Reference: A. Garg, M. Randeria, and N. Trivedi, cond-mat/0609666

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