

Abstract Submitted
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Strong coupling picture of superconductivity in underdoped cuprates II: quasi-particle gap and its symmetry¹ WEI KU, YUCEL YILDIRIM, CMPMS, Brookhaven National Lab — Recent observations of quasi-particle superconducting gap via ARPES and STM revealed important clues to the nature of superconductivity in the underdoped cuprates. Here, we study the quasi-particle gap theoretically in the presence of a larger pseudo-gap, within the strong coupling limit. Without any free parameter, the resulting quasi-particle gap is found to agree very well with the experimental observations. Most surprisingly, at very low doping, the symmetry is found to deviate significantly from the simple *d*-wave shape of the order parameter. In contrast to the Bogoliubov excitation, a new interpretation of the nature of the quasi-particles at the edge of the gap will be presented that is more suitable for the strong coupling region.

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