

Abstract Submitted
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Pseudogap and Superconducting Gap - Same or Different?¹ W.S. LEE, I.M. VISHIK, K. TANAKA, R. MOORE, D.H. LU, T. SASAGAWA, Stanford University, N. NAGAOSA, T.P. DEVEREAUX, University of Waterloo, Z. HUSSAIN, ALS, National Lawrence Berkeley Lab, Z.X. SHEN, Stanford University — The pseudogap state in underdoped cuprates has been one of the central questions in high- T_C research. Recently, whether pseudogap and superconducting gap are same energy gap or two different energy scales is strongly debated in data interpretation of single-particle spectrum, such as ARPES and STM. To gain further insight into this issue, detailed doping dependence and temperature dependence of the gap were studied using ARPES. In contrast to the behavior of the well-known pseudogap in the antinodal region, we found that the behavior of the gap is qualitatively different near the nodal region, a momentum space region overlooked in the previous measurements. This gap seems closely related to the superconductivity; it opens up at T_C and reduces with decreasing doping in the deeply underdoped region following the trend of the superconducting dome in the heavily underdoped region of the phase diagram. The emerging two-gap phenomenon points to a picture of richer quantum configurations in high- T_C superconductors.

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