

MAR09-2008-000367

Abstract for an Invited Paper
for the MAR09 Meeting of
the American Physical Society

Competition between the pseudogap and superconductivity in cuprates¹

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The relationship between the pseudogap and superconductivity is one of the central issues in physics of cuprates. By studying the spectral weights associated with pseudogap and superconductivity by angle resolved photoemission spectroscopy (ARPES) we found that there is a direct correlation between the loss of the low energy spectral weight due to the opening of the pseudogap and a decrease of the spectral weight associated with superconductivity as a function of momentum and doping. We therefore conclude that the pseudogap competes with the superconductivity by depleting the spectral weight available for pairing in the region of momentum space, where the superconducting gap is largest.

¹This work was supported by Basic Energy Sciences, US DOE. The Ames Laboratory is operated for the US DOE by Iowa State University under Contract No. W-7405-ENG-82.