

Abstract Submitted  
for the MAR14 Meeting of  
The American Physical Society

**Remarkable doping effects beyond altering Fermi surface on the superconductivity of iron-based superconductors** Z.R. YE, Y. ZHANG, F. CHEN, M. XU, J. JIANG, X.H. NIU, C.H.P. WEN, B.P. XIE, D.L. FENG, Fudan Univ, L.Y. XING, X.C. WANG, C.Q. JIN, IOP, Chinese Academy of Sciences — The superconductivity in Fe-based superconductors could be achieved by doping the parent compounds. Previous researches were focusing on the charge carrier density or Fermi surface alteration by doping only. However, the dominating factors based on Fermiology have many inconsistencies, which indicates that some other effects induced by doping are neglected. Using ARPES, we have established the microscopic and more comprehensive picture of doping on the electronic structure beyond altering Fermi surface. We have figured out other two critical effects of doping, scattering and changing correlation. With doping, the dxy-related band around the zone center is found to be much more sensitive than the dxz/dyz-related bands and the strength of the impurity scattering strongly depends on the position of dopants, which resembles the case in cuprates. On the other hand, we observed that the electron correlation decreases with doping, which is universal in various systems of Fe-based superconductors. Moderate electron correlation is critical for the high  $T_c$ . The two effects we observed here both are very important for the superconductivity, and explain a lot of previous mysteries and unresolved issues.

Zirong Ye  
Fudan Univ

Date submitted: 11 Nov 2013

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