

# Three-dimensional electronic structure of $\text{BaFe}_2\text{As}_2$ observed by angle-resolved photoemission spectroscopy

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In order to understand the occurrence of SC in Fe-pnictides, many aspects of their electronic structure are still to be uncovered and angle-resolved photoemission spectroscopy (ARPES) is a powerful technique for this purpose. We have performed ARPES measurements on the mother compound  $\text{BaFe}_2\text{As}_2$  (Ba122) as well as the Co-doped superconducting compound  $\text{Ba}(\text{Fe},\text{Co})_2\text{As}_2$  to determine the Fermi surface topology and band dispersion near the Fermi level. In both compounds, we have observed a clear hole pocket near the  $\Gamma$  point and electron pockets near the M point which is consistent with previous ARPES reports on these compounds [1]. Co-doping which induces electrons into this system has resulted in a shrinkage of the hole pocket around  $\Gamma$  point and an enhancement of the electron pocket around M point. Moreover, we have observed clear three dimensionality (strong  $k_z$  dispersion) in the momentum space in both compounds as shown in Fig.1. These results agree with what was predicted by band calculations [2]. Based on these results, we shall discuss the electronic structure of the mother compound Ba122 and the effect of electron doping in this system.

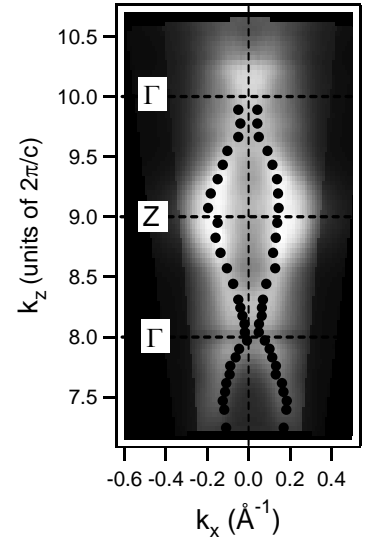


Fig. 1. Fermi surface image of  $\text{BaFe}_2\text{As}_2$  in the  $k_x$ - $k_z$  plane obtained from  $\hbar\omega$ -dependent ARPES data.

[1] K. Terashima *et al.*, arXiv: 0812.3704.

[2] D. J. Singh, PRB, 78 (2008) 094511.