High-energy Hole-like Excitations and the Evolution Mechanism of Fermi Arc in High-Tc Cuprates

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Recently Yazdani [1] has discussed visualizing Cooper pair formation of the atomic scale in high-Tc cuprates by using the scanning tunneling microscopy. That is, for the optimal and overdoped high-Tc cuprates the onset of the gap is indeed due to pairing, which occurs locally at Tp. In addition, it has been suggested that the high- energy(up to about 400meV)hole-like excitations of the normal state are a direct predictor of the strength of pairing, although he cannot present a model for the excitations. The present author [2,3] has proposed the mechanism of T-evolution of the Fermi arc with increasing temperature in high-Tc cuprates, and it is seen that the T-evolution of the Fermi arc is much related to the restoration of the spontaneous symmetry breaking. In this study, we present the evolution mechanism of the Fermi arc with increasing of hole-doping in high-Tc cuprates, and one model for the high-energy(up to about 400meV)excitations, which play an important role on the strength of Cooper pairing. [1]

[1] [1] A. Yazdani, J. Phys. Condens Matters **21**, 164214 (2009). [2] I. Kanazawa, J. Phys. Soc. Jpn. Suppl. **74**, 200 (2005). [3] I. Kanazawa, J. Phys.Chem.Solids **66**, 1388(2005).