

ARPES spectrum asymmetry as a hallmark of low energy renormalization in superconducting cuprates

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A hallmark of weak low energy renormalization of quasiparticle spectrum measured by ARPES is known as a 'kink' on experimental dispersion. It was introduced for the superconducting cuprates along the nodal direction but observed virtually for any metallic crystal with essentially different underlying reasons. Nevertheless, the kinks are often considered as evidence for common scattering mechanism in different families of compounds. For example, the observation of the kinks in traditional metals and cuprates had been considered as evidence for strong electron-phonon interaction. Later, 'similar' kinks in cuprates and ferropnictides have been used to prove the spin-fluctuation nature of renormalization in both families. Here we study a feature in ARPES spectra, the asymmetry of the momentum distribution curves (MDCs), which can help to distinguish different renormalization mechanisms. We have found that noticeable MDC asymmetry is observed for the superconducting cuprates above the kink energy but not for the ferropnictides. We show that the observed asymmetry can be associated with strong momentum dependence of the self-energy.