Role of $d_{xy}$ orbital in iron pnictide superconductivity: Comparative electronic structure studies on LiFeAs and Sr$_2$VO$_3$FeAs

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Please, Bonding angle dependence of superconductivity in iron pnictides is a well-established feature. Despite its importance, the core mechanism behind the bonding angle dependence is still unclear. We present comparative electronic structure studies on two representative systems LiFeAs and Sr$_2$VO$_3$FeAs. Both are suitable for angle resolved photoemissions (ARPES) studies and show superconductivity without any doping while they have different TC’s and bonding angles. Thus, the only difference between the two systems is the bonding angle. We performed high-resolution ARPES studies on LiFeAs and Sr$_2$VO$_3$FeAs. Through comparison of the data from the two systems, we revealed that dxy orbital plays an important role in superconductivity. In addition, we find that orbital mixing, inter-orbital coupling is also an important factor on iron pnictide superconductivity.