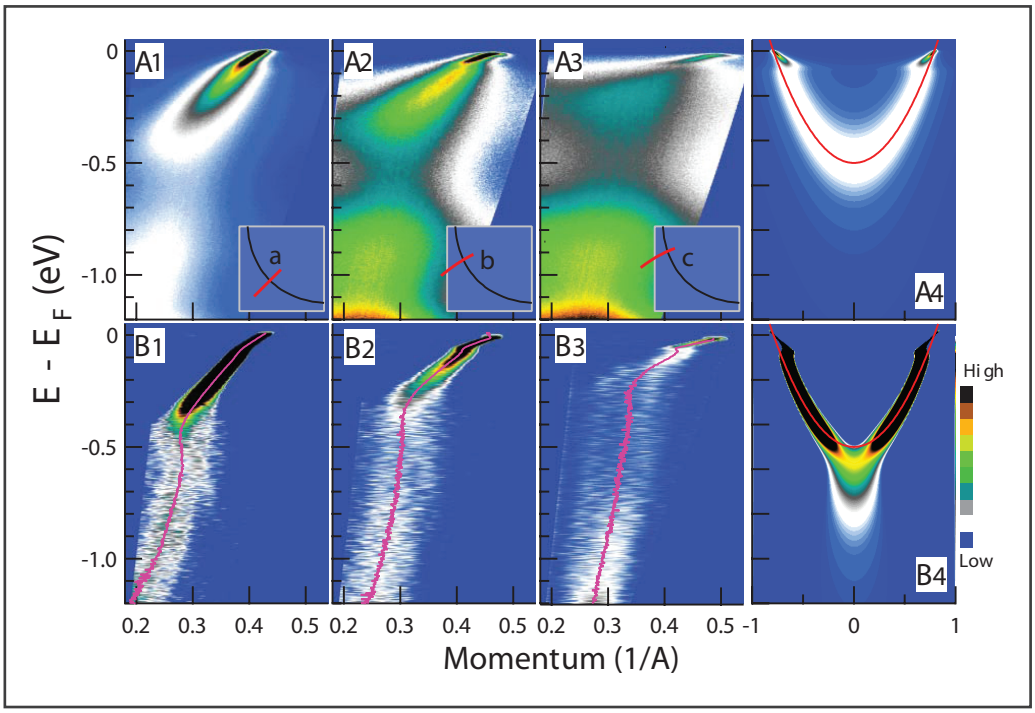
scientaomicron

Application Note
Laser ARPES with R4000

In this application note the high-energy electron dynamics in $Bi_2Sr_2CaCu_2O_8$ high temperature superconductor has been studied by laser-based angle-resolved photoemission.



The ultra-high resolution ARPES measurements were performed using a Scienta Omicron R4000 UPS/ARPES analyser with 0.5 meV energy resolution settings. The VUV laser system in the Prof. X.J. Zhou lab gives photons at 6.994 eV in a bandwidth of 0.26 meV. The total energy resolution in the measurement was therefore 0.56 meV and the momentum resolution was determined to ~0.004 $Å^{-1}$. The Bi2212 single crystals were cleaved in situ in vacuum with a base pressure better than 5×10^{-11} Torr.

The ultra-high resolution data and momentum-dependent measurements in this study provide important information on the nature of the high-energy dispersion and kink. The results rule out the possibility that the high-energy dispersion from the momentum distribution curve (MDC) may represent the true bare band as believed in previous studies. Furthermore, this study also rules out the possibility that the high-energy kink represents electron coupling with some high-energy modes as proposed before. Through detailed MDC and energy distribution curve analyses, Prof. X.J. Zhou et al. propose that the high-energy MDC dispersion may not represent intrinsic band structure.

Data courtesy:
Prof. X.J. Zhou et al., National Laboratory for Superconductivity, Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences

How to contact us for further info:
www.ScientaOmicron.com
info@ScientaOmicron.com