

Time-resolved ARPES at the Advanced Laser Light Source (ALLS) user facility – new insights into the ultrafast quench of superconductivity in Bi-based cuprates

Interviene

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Abstract

Time- and angle-resolved photoemission spectroscopy (TR-ARPES) is a powerful technique for exploring intrinsic and light-induced electrodynamics in quantum materials [1]. In this talk I will present the novel TR-ARPES endstation and the Advanced Laser Light Source (ALLS) user facility. I will show how, by combining sample voltage bias and a hemispherical electron analyzer with next-generation deflector technology, we are able to probe a large fraction of the momentum space of quantum materials even with low photon energy ultraviolet light (6 eV).

This technical capability has allowed us to probe mid-infrared light-driven electron dynamics in $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$ (Bi_2212), the prototypical high-temperature cuprate superconductor, far beyond the previously probed near-nodal region. I will present preliminary results on the momentum dependence of the light-induced melting of the macroscopic superconducting condensate, and I will discuss how this transient state relates to the underlying pseudogapped normal state.

[1] Boschini, Zonno, Damascelli Rev. Mod. Phys. 96, 015003 (2024)

Conferenza

Venerdì 28 giugno 2024

Aula 25, ore 11.00

Università Cattolica del Sacro Cuore

via Garzetta 48, Brescia

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