

# Electrodynamics of hetero-structured high temperature superconductors

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Both the iron-based and the cuprate high temperature superconductors, are intrinsically multi-layered materials. Particular efforts have thus been devoted to the deposition of thin superconducting films and to artificially synthesize heterostructures based onto different superconducting materials. The study of these systems can provide new clues to the understanding of the general mechanism of high temperature superconductivity while offering the possibility to tailor important superconducting properties. An important example is provided by Co-doped Ba122 superlattices, where it was shown that heterostructuring the pristine superconducting compound can result in a substantial enhancement of the upper critical field, due to controlled flux pinning[1]. On the other hand, in cuprates, the fabrication of artificial interfaces between the insulating CaCuO<sub>3</sub> and SrTiO<sub>3</sub> compounds, results in superconducting interfaces, analogous to the Copper-Oxide planes of the cuprates[2]. We address here the electrodynamics of both these classes of heterostructured superconductors[3].

[1] S. Lee *et al.*, Nature Materials **9** 397 (2010).

[2] D. Di Castro *et al.*, Phys. Rev. B **86**, 133424 (2012).

[3] A. Perucchi *et al.*, Applied Physics Letters **104** 22 (2014).