

Poster-1-31

Growth and study of CaCuO₂/SrTiO₃ bilayer thin films

Clémentine Thibault, Adrien Waelchli, Marios Hadjimichael, Stefano Gariglio, and Jean-Marc Triscone

Department of Quantum Matter Physics, University of Geneva

The observation of high T_c superconductivity in infinite-layer cuprates (ACuO₂ with A=Ca, Sr or Ba) [1] has been subject of intense research since its discovery.

Recently, interface superconductivity was observed in CaCuO₂/SrTiO₃ bilayers [2]. It was shown that the doping leading to superconductivity originates from the presence of apical oxygen atoms located in the calcium planes at the interface. The insertion of apical oxygen is related to the proximity of the SrTiO₃ thin film whose perovskite structure promotes addition oxygen in the infinite-layer during the growth [3].

In this work we use pulsed laser deposition to grow CaCuO₂/SrTiO₃ bilayer thin films. We explore various growth parameters (pressure, temperature, O₂/O₃ ratio, gas flow..) with the aim to obtain superconducting interfaces. The structural quality and electronic properties are investigated by X-rays diffraction and electrical transport properties.

[1] T. Siegrist et al., Nature 334, 231–232 (1988).

[2] D. Di Castro et al., Phys. Rev. B 86, 134524 (2012).

[3] D. Di Castro et al., Phys. Rev. Lett. 115, 147001 (2015).