Poster-2-15

Epitaxial growth of $CaTiO_3$ by off-axis RF sputtering

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Light-matter interactions have become a topic of great theoretical and experimental interest in recent years. Pulsed infrared light has been shown to induce metastable ferroelectricity in the incipient ferroelectric $SrTiO_3$ [1]. In an optical cavity, quantum fluctuations of the confined modes of light are proposed to be able to induce or enhance ferroelectricity, even without any illumination [2, 3].
In its bulk form, $CaTiO_3$ is an incipient ferroelectric, while epitaxially strained films grown by pulsed laser deposition or molecular beam epitaxy can show ferroelectricity [4, 5]. The transition temperature and direction of polarisation can be controlled by strain engineering [6].
We demonstrate the growth of epitaxial $CaTiO_3$ thin films by off-axis RF magnetron sputtering on $(La_{0.18}, Sr_{0.82})(Al_{0.59}, Ta_{0.41})O_3$ and $NdGaO_3$ substrates. Characterisation by X-ray diffraction, wavelength-dispersive X-ray spectroscopy, atomic force microscopy, and dielectric measurements demonstrate the excellent quality of our films. We intend to study the quantum-electrodynamic enhancement of ferroelectricity in this system.

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