

# Structural imaging of polar domains inside ferroelectric thin films with the use of tightly focused coherent x-ray nanoprobe and TEM

Ferroelectric thin films demonstrate spontaneous patterns of electric polarization, which can be manipulated with the use of electric fields and used for fast memory storage applications. The structural properties of such systems are greatly influenced by the presence of imperfections inside the crystal lattice. To date, our knowledge of the formation of imperfections and crystalline defects is partial and empirically related to crystal growth. Our focus is to develop novel coherent x-ray imaging tools that allow materials characterization at the nanoscale. We plan to use experimentally measured coherent x-ray nanodiffraction data from epitaxially grown SrTiO<sub>3</sub> thin films and compare them with transmission electron microscopy (TEM) images and modeling.

## Field

A4: Development of experimental techniques (methodology oriented)

## DESY Place

Hamburg

## DESY Division

FS

## DESY Group

FS-CFEL-1

## Special Qualifications:

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