GEMAC Groupe d'Étude de la Matière Condensée

A PROMISING WAY OF THE INTEGRATION OF SINGLE CRYSTALLINE OXIDES IN ELECTRONIC DEVICES

GEMaC and ILV researchers and engineers demonstrate a simple and promising way to transfer epitaxial oxide layers onto silicon

Ternary oxides with a perovskite ABO3 structure are extremely valuable for modern applications, particularly in the field of microelectronics. In order to preserve their physical properties as thin films, these materials require epitaxial growth, generally obtained on a SrTiO3 (STO) reference substrate of the perovskite family. However, these functional oxides suffer from the difficulty of integration in silicon-based technologies, which is essential for their future development. To transfer a single crystalline thin film from STO to Si, we propose here an innovative process involving the use of a water-soluble sacrificial layer of SrVO3 (SVO) between the film of interest and the STO substrate. The immersion of the structure in water and the dissolution of the SVO layer allows to detach an epitaxial layer from STO substrate. The transferred layer retains its initial morphology

and its crystalline quality allowing the production of a pseudo-substrate SrTiO3/Si and, in the long term, the transfer of all-oxide functional heterostructures.



Transfert of the épitaxial film of SrTiO3 onto Si using

a water-soluble sacrificial layer

Read more:

Yoan Bourlier, Bruno Bérini, Mathieu Frégnaux, Arnaud Fouchet, Damien Aureau, Yves Dumont

"Transfer of Epitaxial SrTiO3 Nanothick Layers Using Water-Soluble Sacrificial Perovskite Oxides"

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