

The local structural and chemical properties of LAO-oxide nanostructures

S. Heun, G. Mori, D. Ercolani, M. Lazzarino, and L. Sorba
Laboratorio Nazionale TASC-INFN, I-34012 Trieste, Italy

S. Kremmer, H. Wurmhuber, and C. Teichert
Institute of Physics, University of Leoben, A-8700 Leoben, Austria

A. Locatelli
Sincrotrone Trieste S.c.p.a., I-34012 Trieste, Italy

Abstract

Local anodic oxidation (LAO) using an atomic force microscope with conductive tip (C-AFM) allows the modification of a sample surface on the nanometer scale taking advantage of the unique possibilities of scanning probe microscopy [1,2]. In order to gain a deeper insight in the local structural and chemical properties of the AFM-grown oxide, we performed time-resolved photoemission spectroscopy on Si and GaAs oxide nanostructures by employing spectroscopic photoemission and low energy electron microscopy (SPELEEM). We found a desorption effect due to the irradiation of the oxide patches with extreme ultraviolet (EUV) light. A time-resolved study of the AFM-grown oxide reveals the dynamics of the desorption process. A lineshape analysis of the measured photoelectron spectra provides information on the chemical composition of the C-AFM lines.

- [1] M. Lazzarino, S. Heun, B. Ressel, K. C. Prince, P. Pingue, and C. Ascoli: *Appl. Phys. Lett.* **81** (2002) 2842.
- [2] M. Lazzarino, S. Heun, B. Ressel, K. C. Prince, P. Pingue, and C. Ascoli: *Nucl. Instr. and Meth. in Phys. Res. B* **200** (2003) 46.