SEMINAIRE ISMO

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Scanning Probe Microscopy and Focused Ion Beam for Local Nanocharacterization and Nanofabrication, Respectively

The development of modern micro- and nano-electronics elements leads to implementation of new methods of analysis and monitoring of material and structure properties with atomic resolution. Thus, a Scanning Probe Microscope (SPM) -Atomic Force & Scanning Tunnelling Microscopies (AFM/STM) is a powerful tool for local characterization at the nanoscale.

My work consists in two main topics:

- Investigation physical properties of materials and nanostructures by different AFM/STM methods;
- Fabrication of cantilevers and probes (SPM sensors) by Focused Ion Beam (FIB).

In this presentation, I will present and discuss my last results. In the first part, results of the project “INTerfaces in thin films – Capacitors 2015” * will be presented. This project is dedicated to the investigations and the development of thin films obtained by Pulsed Laser Deposition -$SrRuO_3/Ba_{1-y}Sr_yTiO_3$ (SRO/BSTO) thin films. In these films, we wanted to govern the physical properties at the interface by modulating composition. Our attention was mainly focused on growth process (topography), electrical proprieties (work function)... I was in charge of these AFM characterisations and I will present results concerning:

- Identification of current leakage areas which impact on films capacity;
- Determination of the piezoelectric response (d_{33}) of BSTO, that should be as high as possible;
- Determination of the work function to identify SRO electrode properties, and BSTO composition for the optimal dielectric properties.

In the second part, results obtained in collaboration with other groups (material science and biology) will be also shown. Using these results I will enlighten other AFM/STM techniques for investigations of thin films, ceramics, single crystals (→ nano-electronics), and FepC nanodiamonds (→bio technology).

Finally, I will show what is possible to do with a Dual FIB (FIB-SEM): fabrication of nanostructures and modification of both AFM tips and STM probes.

Mardi 12 avril 2016 à 11h
Bât 351 – 2ème étage (Bibliothèque)
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