Up-to-Date XRD Techniques for Investigating Ultra thin Films and Ultra Small Spots

H. Guerault, A. Vigliante, M. Zimmermann
Bruker-AXS, Karlsruhe, Germany

Due to their unique X-ray beam properties, synchrotron sources have always played a very important role in the studies of structural properties and critical phenomena of surfaces and interfaces. However, the rapid progress in nanotechnology and nanomaterials has resulted in an increasing demand to characterize ultra thin films, nanostructure and organic thin films with laboratory X-ray instrumentation. The data collected with a laboratory set-up can be used as preliminary sample screening before synchrotron/neutron measurements or to monitor and improve sample growth.

In this talk, I will discuss ongoing developments in X-ray sources, optics, and detector technologies for laboratory instrumentation dedicated to the study of ultra thin films. Several representative systems are chosen to illustrate the instrumental characteristics and performance. Most of the instrumentation developments were driven by the semiconductor and soft matter community to characterize ultra thin films, quantum dots, or quantum wires.