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Pulsed Laser Deposition cell for in-situ experiments with neutron reflectometry

Monday, 14 May 2018 17:00 (20 minutes)

Phenomena and effects on interfaces and in individual atomic layers play a key role in the modern material science, especially in the field of nanotechnologies (nanoelectronics, photonics, plasmonics, etc). The pulsed laser deposition (PLD) technique is a versatile tool with a capability of using a wide variety of materials to produce such structures. Neutron radiation offers a unique possibility for in situ investigation of multilayer thin films growing processes and for investigation of the as-grown structures. In particular, the method of spin-sensitive neutron polarization reflectometry (NPR) (in the low temperatures (<15 K) and high magnetic fields (>1 T) is extremely sensitive for the structural and magnetic properties of materials.

Drawing on our own in situ PLD experience at synchrotrons and neutron facilities and in view of the very wide range of scientific tasks that can be solved by such approach, we have developed a series of mobile PLD setups for various in situ and in vacuum synchrotron and neutron techniques. All devices have a mobile configuration and have to be compatible with the existing and future beamlines and instruments. In the presentation, we will give an overview of the experimental chambers and concepts and their application fields.

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