

In-Situ Neutron Reflectometry during Thin Film Growth by Sputter Deposition

Thursday 18 June 2015 09:44 (20 minutes)

While the structural characterisation of thin films during growth by various in-situ techniques is common practice, the in-situ measurement of the magnetic properties of films using (polarized) neutron reflectometry is a challenging task. Within a collaboration of TUM, Uni Augsburg and MPI Stuttgart, we operate a mobile sputtering facility for the growth and in-situ monitoring of magnetic multilayers. In our contribution, the setup and polarized in-situ neutron reflectivity measurements on in-situ grown Fe/Cr carried out at the ToF reflectometer REFSANS at the FRM II neutron source and at the AMOR beamline at PSI will be presented. At the latter, use of the Selene neutron optical concept allows very fast polarised neutron reflectivity measurements to be performed within only 15min per spin direction, allowing for un-contaminated surfaces in the coating process. As further example, induced magnetism in Pd/Fe/Pd heterostructures, observed using this method, will be presented.

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Session Classification: Material Science

Track Classification: Material Science