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Thin film fabrication for neutron investigations

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The Jülich Centre for Neutron Science offers the opportunity to fabricate thin film samples by Molecular Beam Epitaxy (MBE). We are running an MBE setup with effusion cells, electron guns for electron beam evaporation and a plasma source for use with oxygen or nitrogen. A large variety of deposition materials can be used. Please express your ideas! In the past, we have produced simple Fe layers, complicated multilayers consisting e.g. of layers of Ti, Pt and Co, transition metal oxides like $La_{0.7}Sr_{0.3}MnO_3$ or oxides like TiO2.

Discuss your ideas with the thin film lab staff at the poster and then write the proposal! There are two options for access: In remote access the thin film lab staff fabricates the sample for you and in collaborative access you fabricate the sample with support by the thin film lab staff. Evidently, the first option only works if the growth parameters are well known.

The samples can be investigated in-situ by reflection high and low energy electron diffraction for surface structure analysis while Auger electron spectroscopy may be applied for in-situ chemical surface analysis.

Thin film samples which are sensitive to ambient conditions are first fabricated in the MBE setup and then measured at the neutron reflectometer MARIA of JCNS utilizing a versatile small ultra high vacuum condition chamber (A. Syed Mohd et al. Rev. Sci. Instrum., 87, (2016) 123909).

In the poster various examples for thin film samples will be presented.

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