EPSRC CENTRE FOR DOCTORAL TRAINING
NEW AND SUSTAINABLE
PHOTOVOLTAICS

Lab 4 : Profilometry

Aim:

The profilometer is a simplified AFM, used to measure the thickness of the layers we grow. A probe tip on the edge of a cantilever is moved across a surface, and the deflections caused by the undulations of the layer displace a laser beam. A detector tracks the position of the laser spot and translates it into surface height. Therefore, we can measure the difference between an underlying substrate and the deposited layer to find the thickness of the layer.

In this experiment we will measure the thickness and roughness of sputtered layers.

Video lab-script: http://tinyurl.com/cdtpv-labs

Tasks:

1. Make sure you have completed a risk assessment for this lab.
2. Calibrate the profilometer, using the reference sample, in the lowest functioning range (10μm currently).
3. Measure the thickness of the sample layers
4. Extract the roughness
5. Output your data to a file

Questions:

1. How thick is the material at the centre for each sample?
2. How thick is the material at the edges for each sample?
3. What is the RMS roughness of each layer?