

Tutorial Sheet – Lecture 7

X-Ray Diffraction of Epitaxial Layers

RA Hogg
r.hogg@shef.ac.uk

- 1) Describe, in your own words;
 - What is meant by epitaxial growth.
 - How a thin layer of strained material may be grown to be pseudomorphic with the substrate. How is the lattice distorted?
 - The limitations of epitaxially growing a strained layer upon a substrate.
- 2) Explain briefly how a symmetric X-ray diffraction scan of planes close to parallel to the surface of a thick sample provides a measurement of the lattice parameter. Describe what is meant by a symmetric and asymmetric scan.
- 3) Describe the effect of growing a strained superlattice of material (e.g. an InGaAs/GaAs multi-quantum-well stack) upon the 2 Theta-Omega scan.
- 4) How may the presence of thick, highly strained layers affect X-Ray diffraction measurements?