

# Bede REFS Report

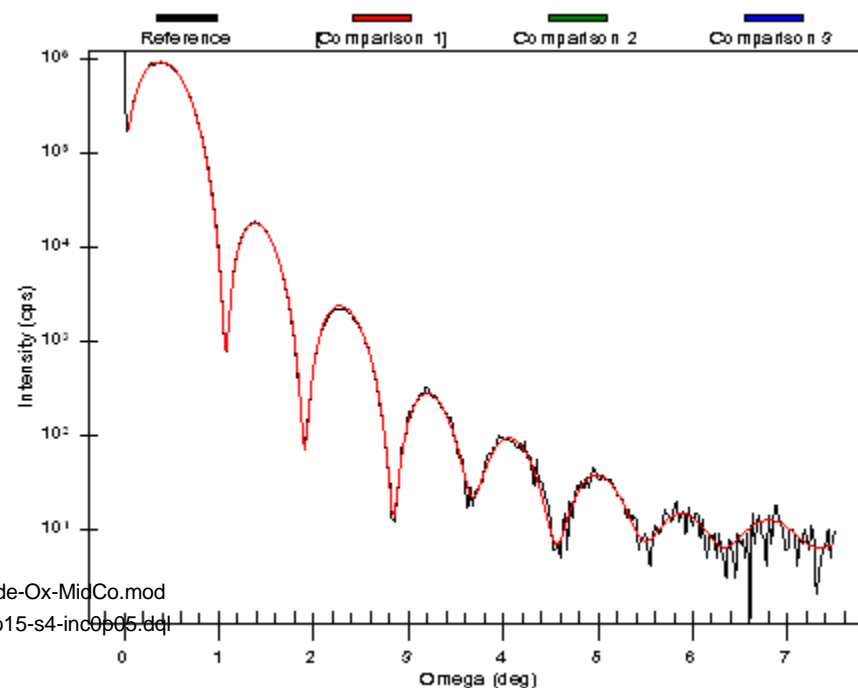
## SUMMARY

**Company:** Condensed Matter Physics, Sch of Physics & Astronomy, University  
**Equipment:** Bruker parameter settings  
**Operator:** Mannan Ali  
**Lot:**  
**Carrier:**  
**Substrate:**  
**Site:**  
**Comments:** Note that these are the parameter settings for Bruker D8

**Description:** Specular X-ray reflectivity scan assuming 1.541 Å radiation. The incident and background intensities are 17452340.61 cps and 25.48 cps, respectively. The sample angle (Omega) starts at 0.05 deg, and finishes at 7.5 deg with a step-size of 0.025 deg. Simultaneously, the detector angle (2Theta) starts at 0.1 deg and finishes at 15 deg with a step-size of 0.05 deg.

## FILES

**Model:** S:\Projects\PMA systems\Adam\Arkengarthdale\AW270614\AW270614-20-LAX-Ark-Bede-Ox-MidCo.mod  
**Reference:** S:\Projects\PMA systems\Adam\Arkengarthdale\AW270614\AW270614-20-LAX-Ark-0to15-s4-inc005.dat  
**Comparison 1:**  
**Comparison 2:**  
**Comparison 3:**  
**Goodness of fit:** 0.063



ID	THICKNESS (Å)	MATERIAL	X	Y	DENSITY (%)	Roughness	GRADING (Å)	LAMELLAE	PERIODS
SUB.	∞	Al2O3	0.000	0.000	101.12	0.37	0.00	1	
1	1.37	Al2O3	0.000	0.000	5.64	1.66	0.00	1	
2	29.96	Pt	0.000	0.000	104.85	6.69	0.00	1	
3	0.13	Co	0.000	0.000	124.67	0.04	0.00	1	
4	6.32	Co	0.000	0.000	105.72	5.91	0.00	1	
5	10.63	Pt	0.000	0.000	99.61	4.02	0.00	1	
6	2.38	PtO	0.000	0.000	54.35	0.92	0.00	1	

**EQUIPMENT****Incident Beam**

Width: 0.2 mm  
Height: 10 mm  
Divergence: 0.003 deg

**Detector Slits**

Width: 0.1 mm  
Height: 5 mm  
Distance to Sample: 29 cm  
Acceptance: 0.01976 deg

Include Equipment Function: ☒

**OPTIONS****Units**

Angle Units: Degrees  
Length Units: Ångstroms  
Output Units: Real Space

**Diffuse Scans**

Include Specular Intensity: ☒  
Use C(r) Instead of exp[C(r)-1]: ☐  
Use Modified Born Approximation: ☐

**MEASUREMENT**

Scan Type: Specular  
Wavelength: 1.541 Å  
Intensity: 17452340.61 cps  
Background: 25.48 cps

**Sample  $\Psi$  Axis**

Start: 0.05 deg  
Finish: 7.5 deg  
Step: 0.025 deg

**Detector  $\Theta$  Axis**

Start: 0.1 deg  
Finish: 15 deg  
Step Size: 0.05 deg

Data Points: 299

**EVOLVER**

Population Size: 30  
Crossover Factor: 0.5  
Mutation Factor: 0.7  
GOF Function: MAE (log10)

**Complete When**

☐ Iterations = 5000  
☐ Generations = 1000  
☐ Elapsed Time (s) = 600  
☐ GOF Function <= 0.001

**SAMPLE****ROUGHNESS (Å)****Uncorrelated Interfaces**

Correlation Length: 10000 Å  
Fractal Exponent: 1  
Miscut Angle: 0 deg

Length: 10 mm

Width: 10 mm

Radius of Curvature:  $\infty$