

Work report 140222: Co-sputtered ZnO-SnO₂

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1 Overview

Deposition and optical characterisation of co-sputtered Zn-Sn-O film. Sample sent to Brookhaven National Synchrotron Light Source for XAS - Louis Piper. Film profiles determined using ellipsometry - interpolated from 81pt measurement grid over $8 \times 8 \text{ cm}^2$ central area. Identical samples sent to Cranfield University (XRD mapping) and UCL (XPS mapping)

2 Film recipe

Sample ID: 140218_3

- Substrate: OptiWhite SLG, $10 \times 10 \text{ cm}^2$, 4mm thick.
- Material: ZnO:SnO₂ (co-sputtered)
- Power (W): 250:80
- Pressure (mTorr): 5 (Ar)
- Growth Time: 60 min
- Rotation: OFF

3 Film profiles

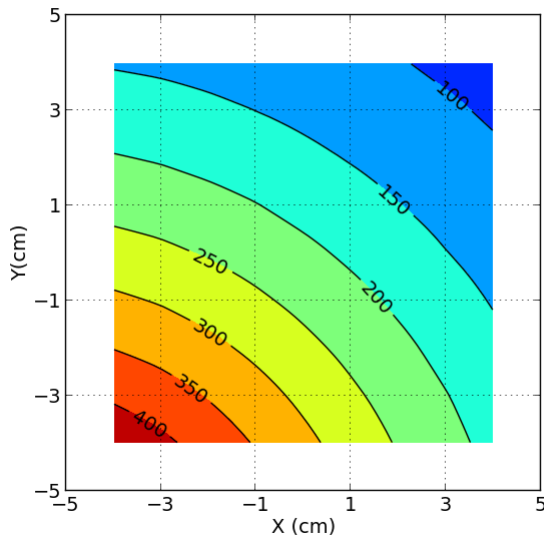


Figure 1: ZnO calibration sample. Contours show film thickness (in nm).

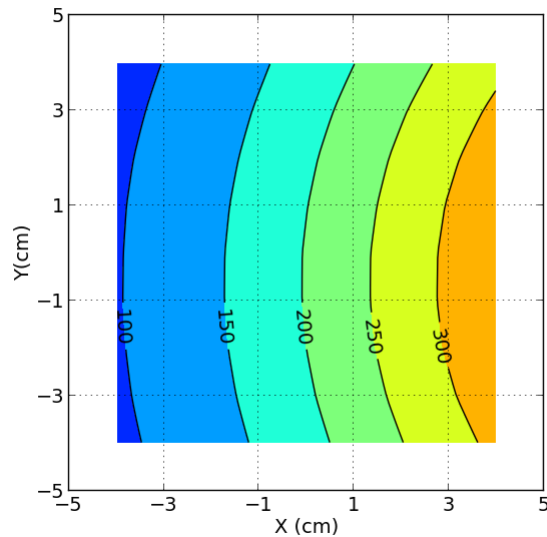


Figure 2: SnO₂ calibration sample. Contours show film thickness (in nm).

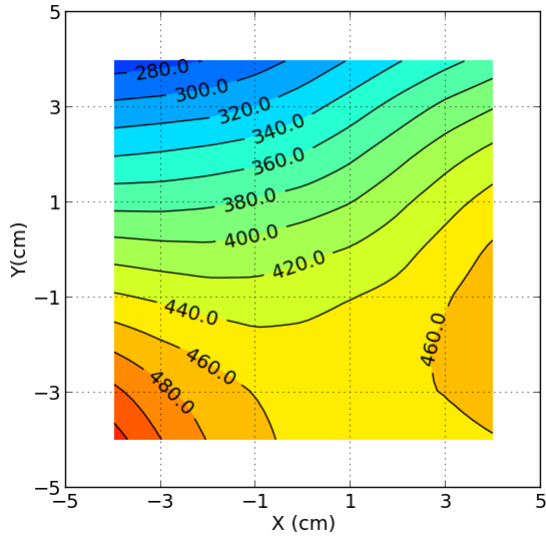


Figure 3: Calculated thickness of co-sputtered ZnO:SnO₂ film. Contours show film thickness (in nm).

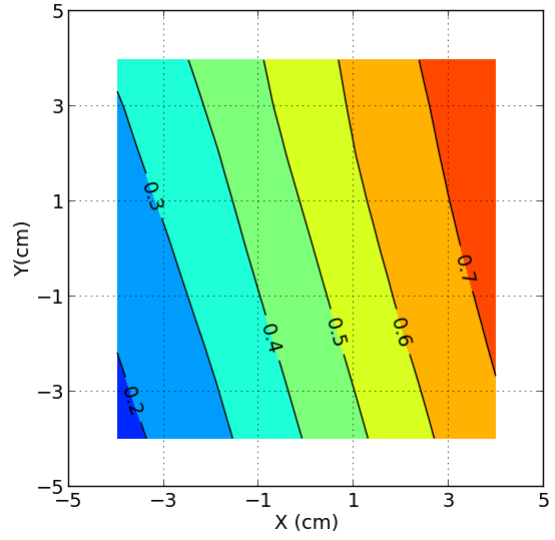


Figure 4: Profile of ratio $d_{\text{SnO}_2} / (d_{\text{ZnO}} + d_{\text{SnO}_2})$ calculated using figures 1 and 2.



Figure 5: Sample 140218.3. Cut into 25 $2 \times 2 \text{ cm}^2$ pieces (some pieces uneven due to poor cutting). Orientation of sample in this photo corresponds directly with profile shown in figure 4. Note: Film side is face-up in this photo.