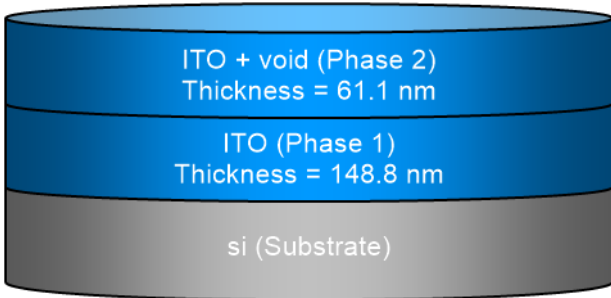


SEA regression report summary

Sample ID
001c-int-ii 70° 1

Details	
Software and regression log	
Software about	Semilab - Spectroscopic Ellipsometry Analyzer - SEA
Software version	1.7.1
Officially licensed to	MIT
Operator	operator
Date and time of regression	14-07-2021 14:13
Comments	

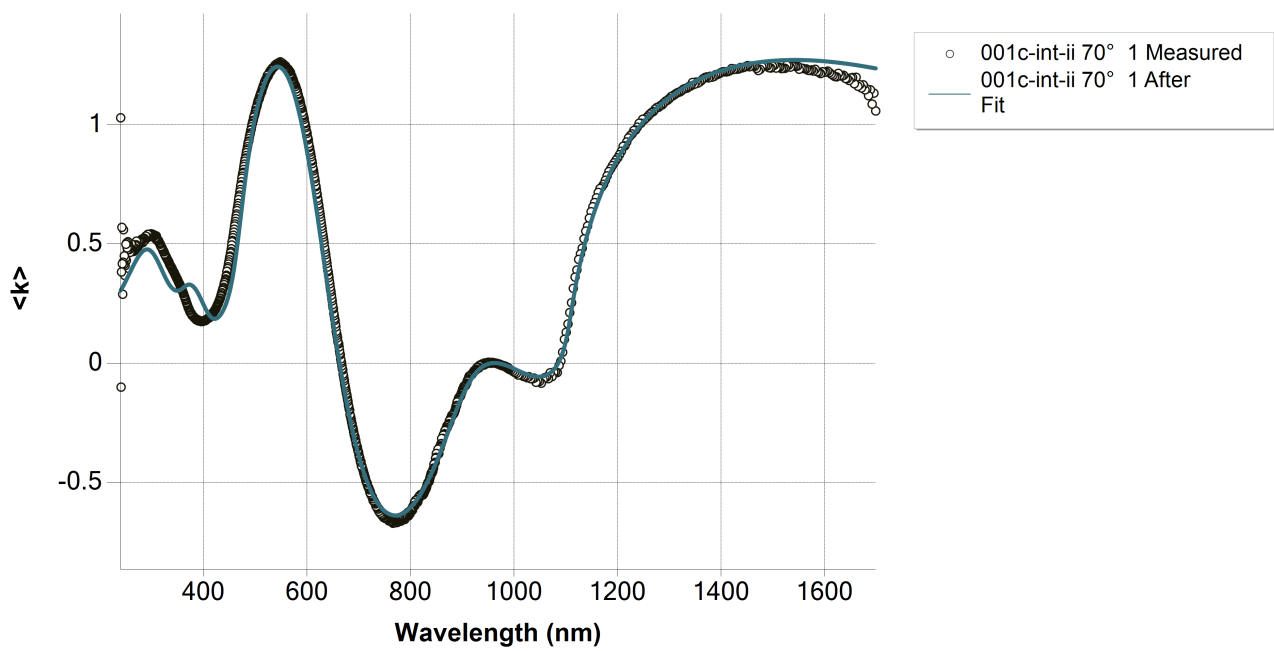
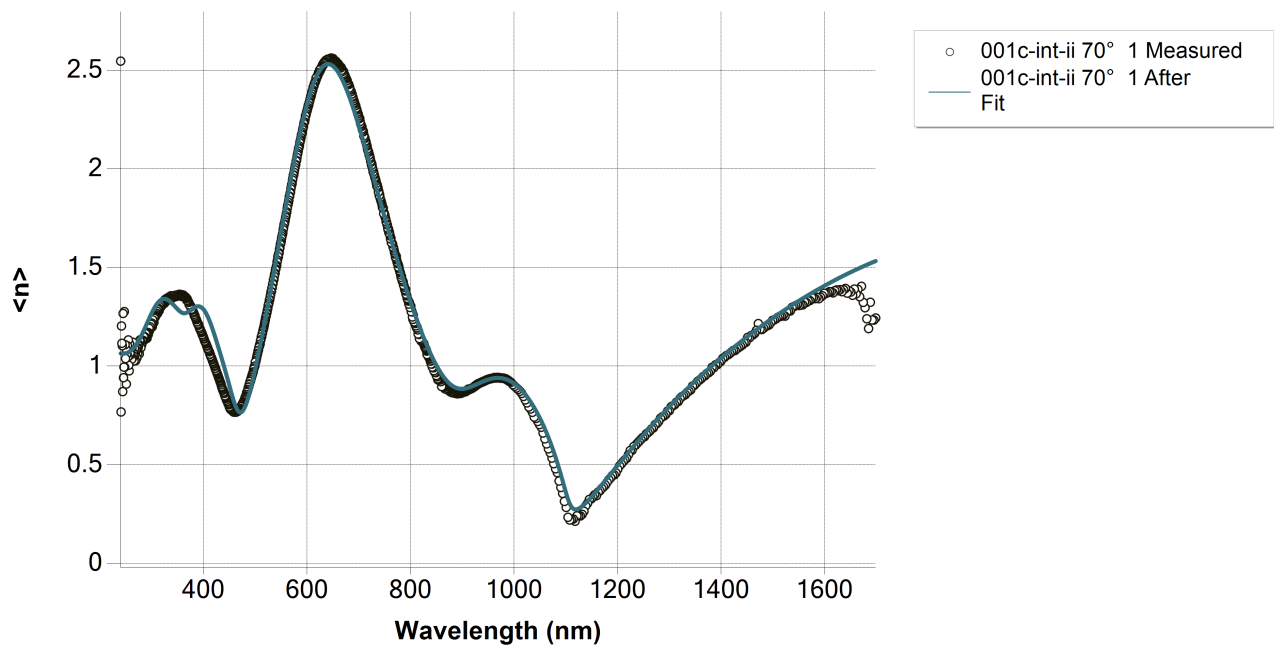
Layer structure	
Overview	
	
Optical model	
Phase 2	ITO + void
Diffusion	
Phase 1	ITO
Dispersion law	Tauc-Lorentz
	Drude
	Lorentz

Regression results

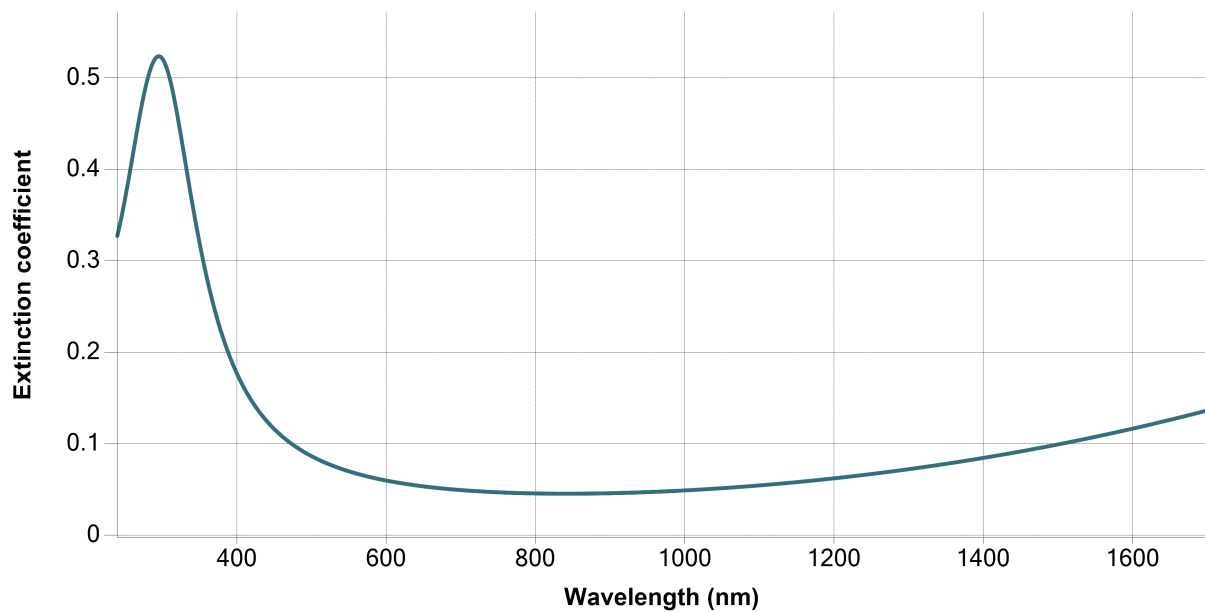
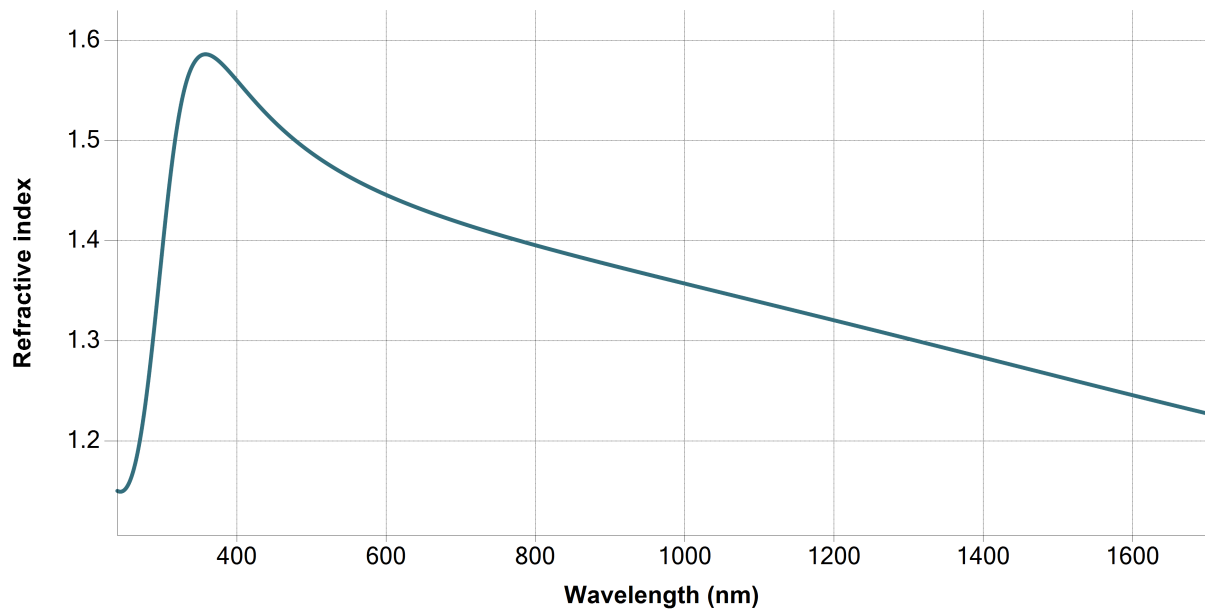
Measurement information				
Measurement file path	C:\Users\emmabat\lito-sil\001c-int-ii.smdx			
Angle of Incidence	70°			
Regression details				
Regression 1 (EllipsoReflectance)				
Wavelength range	239.84 - 1698.83 nm			
Angle of Incidence	70°			
Fit to	<n>, <k>			
Angular Aperture	0°			
Fit algorithm	LMA			
Results				
Parameters	Value	Fitted	2 σ confidence limit	Unit
Model				
AOI Shift	0			°
Angular Aperture	0			°
Phase 2 (ITO + void)				
Thickness	61.115	X	0.44094	nm
Depolarization coefficient	0.33333			
Concentration 1	0.5			
Concentration 2	0.5			
Phase 1 (ITO)				
Thickness	148.848	X	1.17463	nm
A (eV)	499.9547			eV
E0 (eV)	6.0053			eV
C (eV)	72.66552			eV
Eg (eV)	3.60579	X	0.051916	eV
E_p (eV)	0.98771	X	0.0090784	eV
E_Γ (eV)	0.3767	X	0.01762	eV
f	1.46858	X	0.026391	
E0 (eV)	4.01087	X	0.025292	eV
Γ (eV)	1.40803	X	0.027224	eV
Eps_inf	0			
Derived parameters	Value			
Phase 2 (ITO + void)				
n @ 632.8 nm	1.4356			
k @ 632.8 nm	0.0552			
Phase 1 (ITO)				
n @ 632.8 nm	1.9171			
k @ 632.8 nm	0.1201			
Substrate (si)				
n @ 632.8 nm	3.8811			
k @ 632.8 nm	0.0195			
Drude derived parameters	Value			Unit
Phase 1 (ITO)				
Conductivity (S/m)	3.4838E+04 ± 2269.9727			S/m

Resistivity (mΩ.cm)	2.8704 ± 0.187	mΩ.cm
Resistance (Ω/sq)	192.8436 ± 14.0872	Ω/sq
N type dopant concentration (at/cm ³)	$1.7688\text{E}+20 \pm 3.2516\text{E}+18$	at/cm ³
P type dopant concentration (at/cm ³)	$2.6179\text{E}+20 \pm 4.8124\text{E}+18$	at/cm ³
N type dopant mobility (cm ² /Vs)	12.2929 ± 0.8322	cm ² /Vs
P type dopant mobility (cm ² /Vs)	8.306 ± 0.5623	cm ² /Vs
Fit quality		
R ²	0.98913	
RMSE	0.06109	

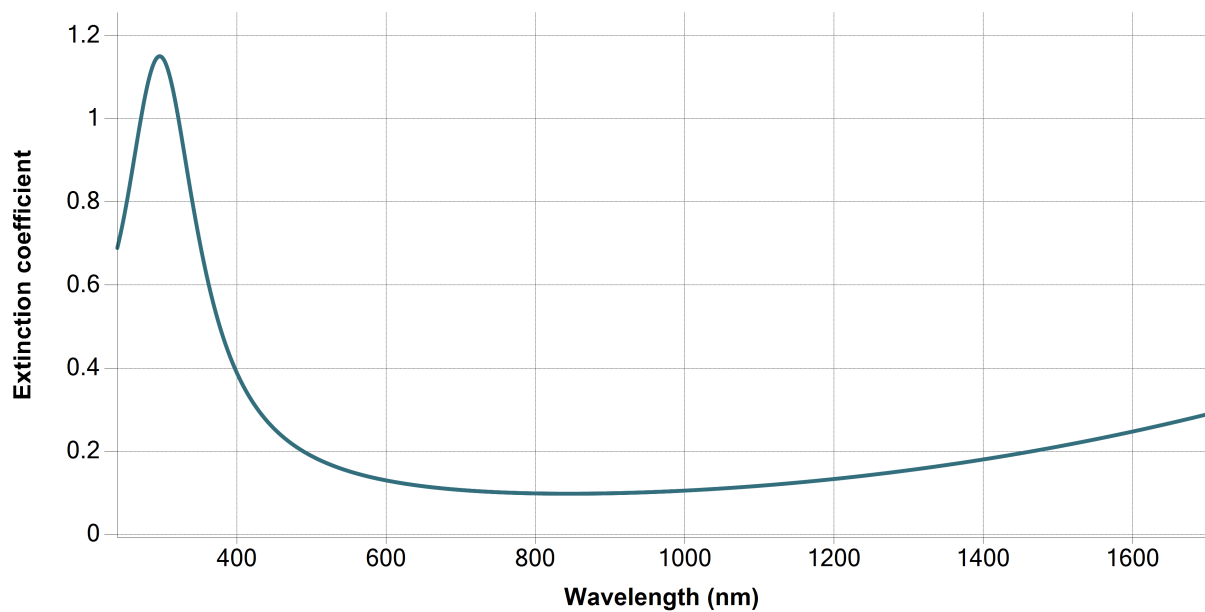
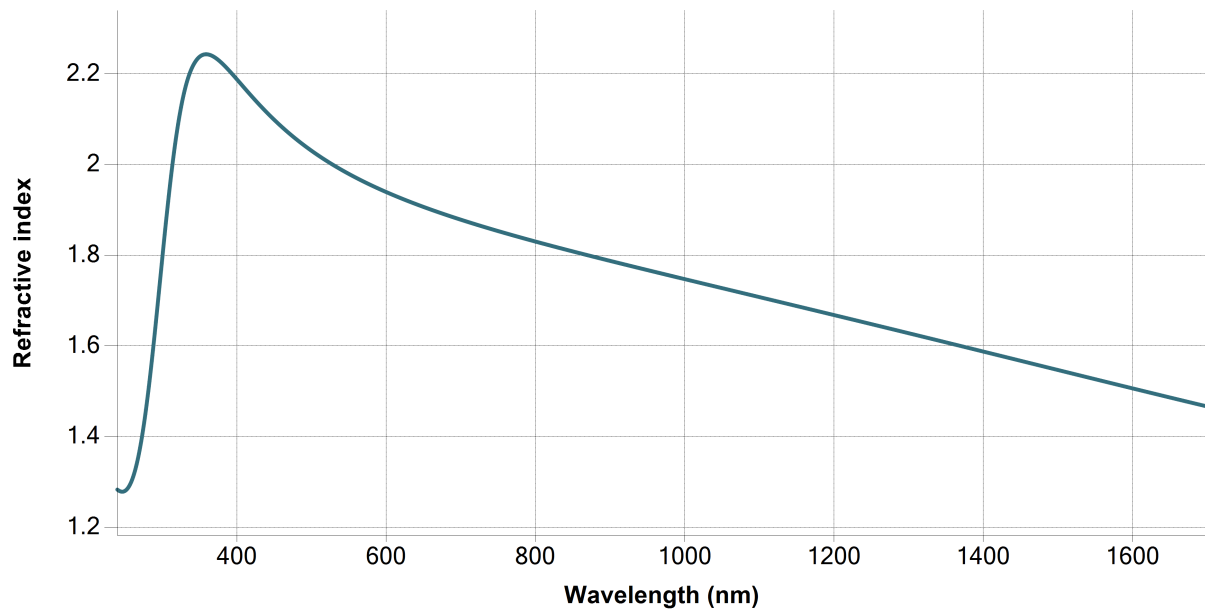
Regression graphs



Phase 2 (ITO + void) - Dispersion graphs



Phase 1 (ITO) - Dispersion graphs



Substrate (si) - Dispersion graphs



Correlation coefficients	
Ph2 - ITO + void - Thickness --- Ph1 - ITO - Thickness	-0.3748
Ph2 - ITO + void - Thickness --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	-0.1089
Ph2 - ITO + void - Thickness --- Ph1 - Drude[2] - E _p (eV)	-0.3478
Ph2 - ITO + void - Thickness --- Ph1 - Drude[2] - E _Γ (eV)	-0.0147
Ph2 - ITO + void - Thickness --- Ph1 - Lorentz[3] - f	-0.1043
Ph2 - ITO + void - Thickness --- Ph1 - Lorentz[3] - E0 (eV)	-0.2641
Ph1 - ITO - Thickness --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	0.4985
Ph1 - ITO - Thickness --- Ph1 - Drude[2] - E _p (eV)	0.4064
Ph1 - ITO - Thickness --- Ph1 - Drude[2] - E _Γ (eV)	0.5985
Ph1 - ITO - Thickness --- Ph1 - Lorentz[3] - f	-0.1196
Ph1 - ITO - Thickness --- Ph1 - Lorentz[3] - E0 (eV)	0.5306
Ph1 - Tauc-Lorentz[1] - Eg (eV) --- Ph1 - Drude[2] - E _p (eV)	-0.1761
Ph1 - Tauc-Lorentz[1] - Eg (eV) --- Ph1 - Drude[2] - E _Γ (eV)	0.2675
Ph1 - Tauc-Lorentz[1] - Eg (eV) --- Ph1 - Lorentz[3] - f	0.7328
Ph1 - Tauc-Lorentz[1] - Eg (eV) --- Ph1 - Lorentz[3] - E0 (eV)	0.6347
Ph1 - Drude[2] - E _p (eV) --- Ph1 - Drude[2] - E _Γ (eV)	0.2056
Ph1 - Drude[2] - E _p (eV) --- Ph1 - Lorentz[3] - f	-0.249
Ph1 - Drude[2] - E _p (eV) --- Ph1 - Lorentz[3] - E0 (eV)	0.2496
Ph1 - Drude[2] - E _Γ (eV) --- Ph1 - Lorentz[3] - f	-0.2587
Ph1 - Drude[2] - E _Γ (eV) --- Ph1 - Lorentz[3] - E0 (eV)	0.1318
Ph1 - Lorentz[3] - f --- Ph1 - Lorentz[3] - E0 (eV)	0.5115