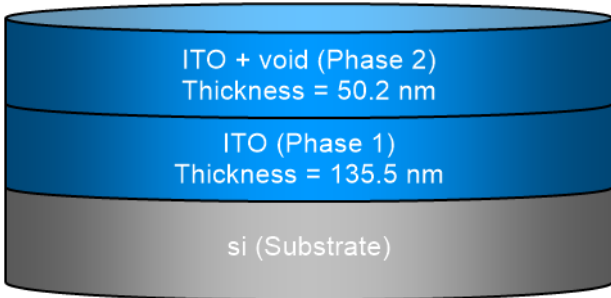


SEA regression report summary

Sample ID
001b-int-i 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 14:07
Comments	

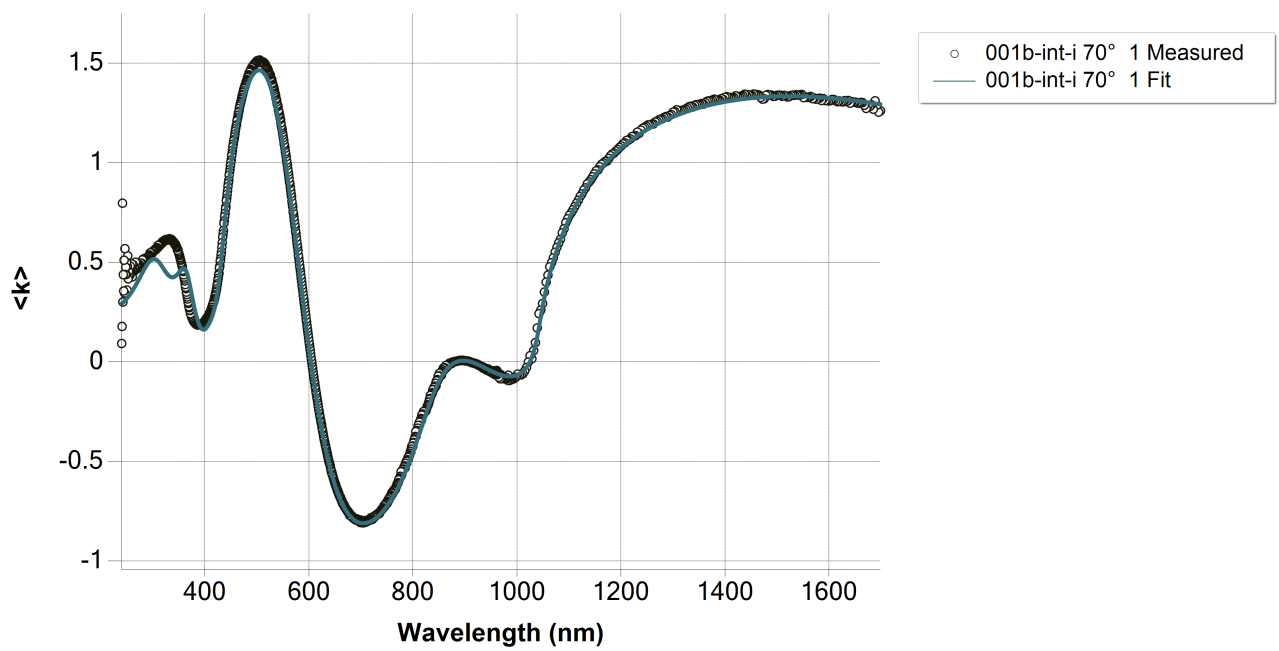
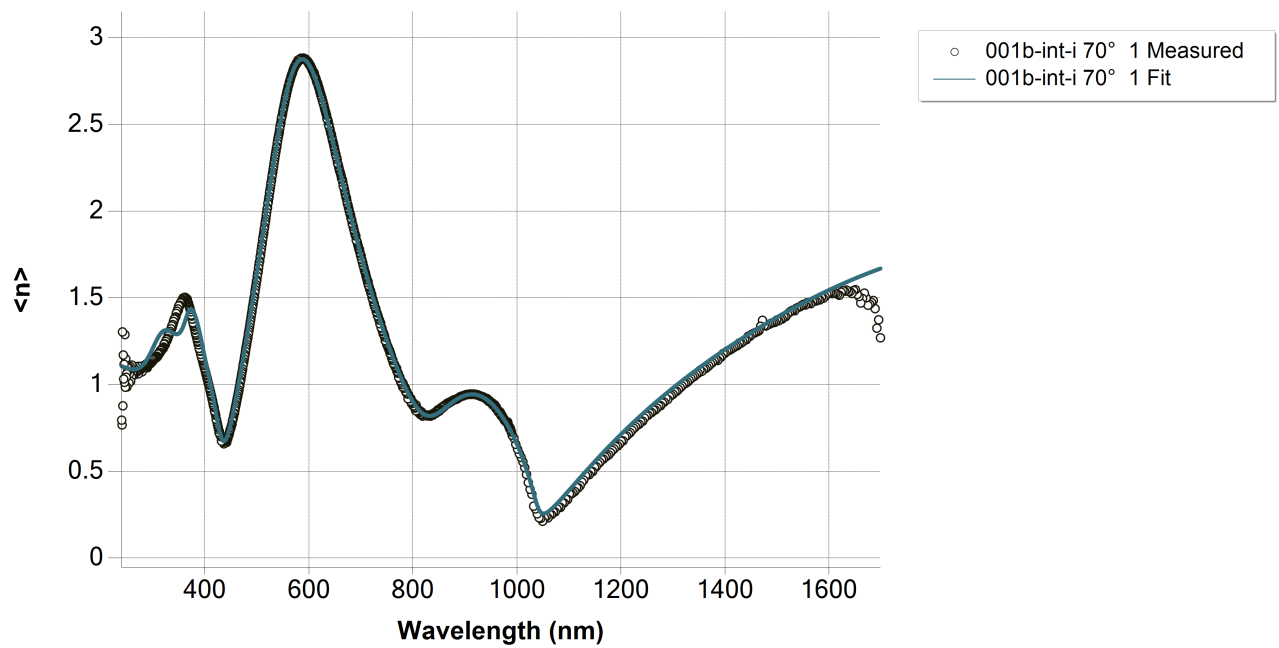
Layer structure	
Overview	
	
Optical model	
Phase 2	ITO + void
Diffusion	
Phase 1	ITO
Dispersion law	Tauc-Lorentz
	Drude
	Lorentz

Regression results

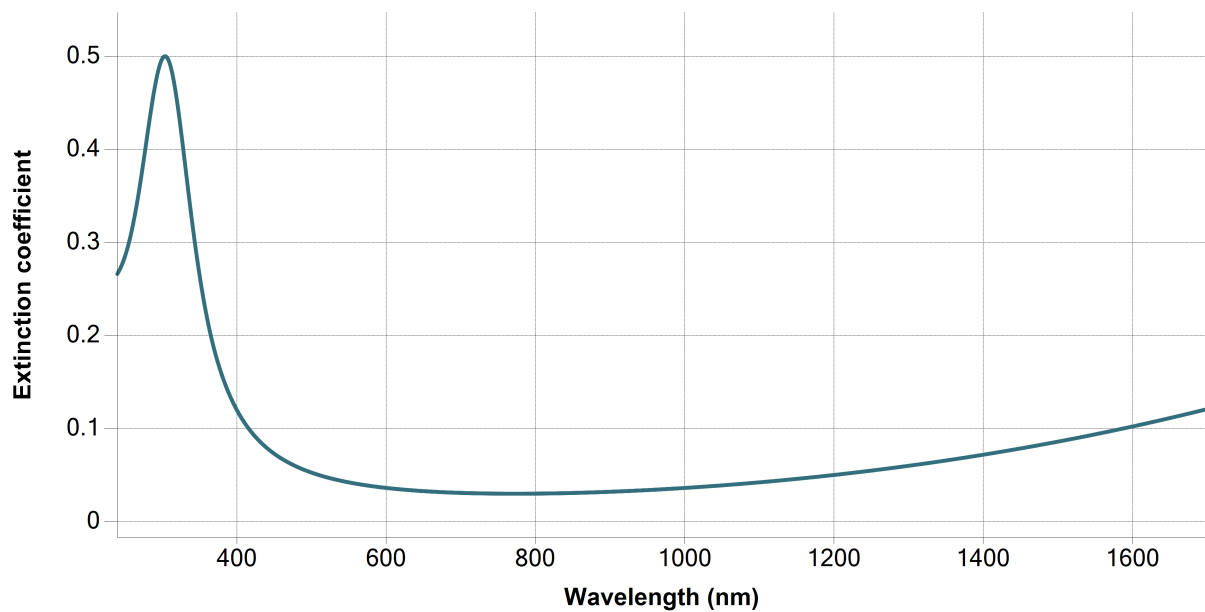
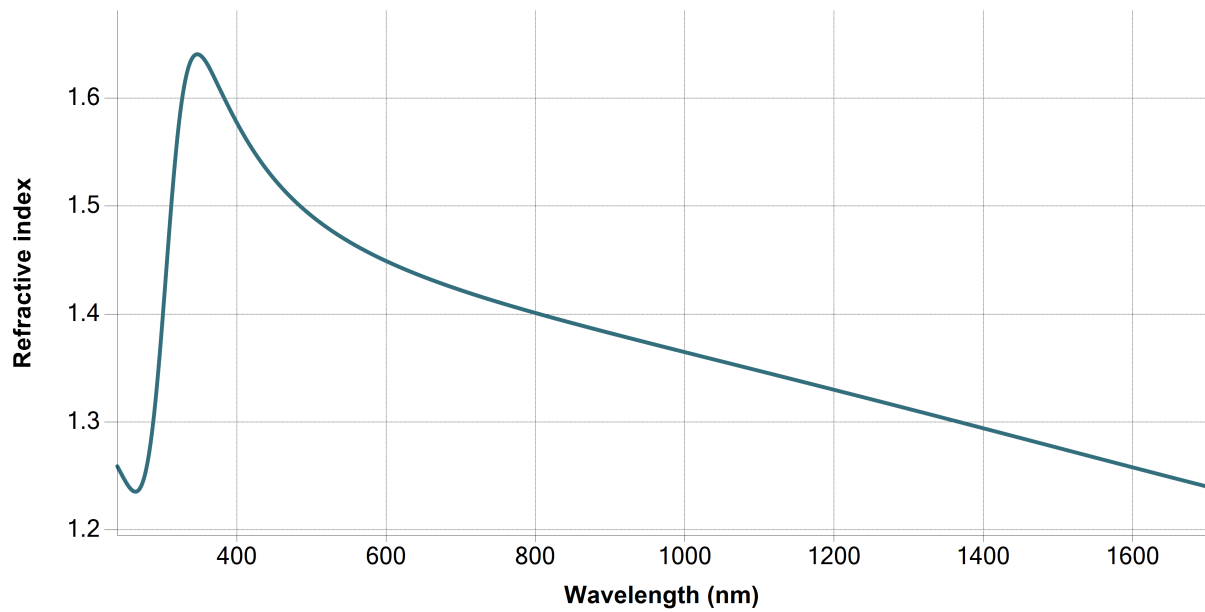
Measurement information				
Measurement file path	C:\Users\emmabat\lito-sil\001b-int-i.smdx			
Angle of Incidence	70°			
Regression details				
Regression 1 (EllipsoReflectance)				
Wavelength range	239.84 - 1698.83 nm			
Angle of Incidence	70°			
Fit to	<n>, <k>			
Angular Aperture	0°			
Fit algorithm	LMA			
Results				
Parameters	Value	Fitted	2 σ confidence limit	Unit
Model				
AOI Shift	0			°
Angular Aperture	0			°
Phase 2 (ITO + void)				
Thickness	50.197	X	0.29227	nm
Depolarization coefficient	0.33333			
Concentration 1	0.5			
Concentration 2	0.5			
Phase 1 (ITO)				
Thickness	135.516	X	0.72116	nm
A (eV)	499.9547			eV
E0 (eV)	6.0053			eV
C (eV)	63.8341	X	3.44088	eV
Eg (eV)	3.32841	X	0.1436	eV
E_p (eV)	0.96711	X	0.0088029	eV
E_Γ (eV)	0.37227	X	0.015583	eV
f	1.07241	X	0.0279	
E0 (eV)	3.94666	X	0.018211	eV
Γ (eV)	1.02731	X	0.023051	eV
Eps_inf	0			
Derived parameters	Value			
Phase 2 (ITO + void)				
n @ 632.8 nm	1.4392			
k @ 632.8 nm	0.0336			
Phase 1 (ITO)				
n @ 632.8 nm	1.9251			
k @ 632.8 nm	0.0732			
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)	3.3797E+04 ± 2029.9699			S/m

Resistivity (mΩ.cm)	2.9588 ± 0.1777	mΩ.cm
Resistance (Ω/sq)	218.3373 ± 14.2759	Ω/sq
N type dopant concentration (at/cm ³)	$1.6958\text{E}+20 \pm 3.0872\text{E}+18$	at/cm ³
P type dopant concentration (at/cm ³)	$2.5098\text{E}+20 \pm 4.569\text{E}+18$	at/cm ³
N type dopant mobility (cm ² /Vs)	12.4392 ± 0.7807	cm ² /Vs
P type dopant mobility (cm ² /Vs)	8.4049 ± 0.5275	cm ² /Vs
Fit quality		
R ²	0.99512	
RMSE	0.04765	

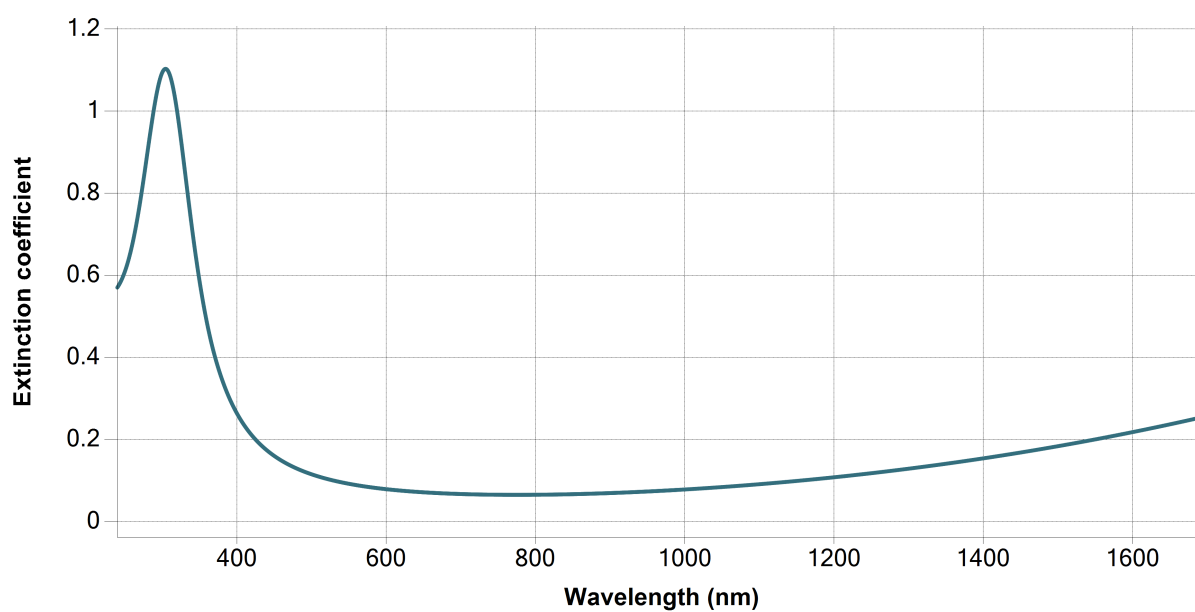
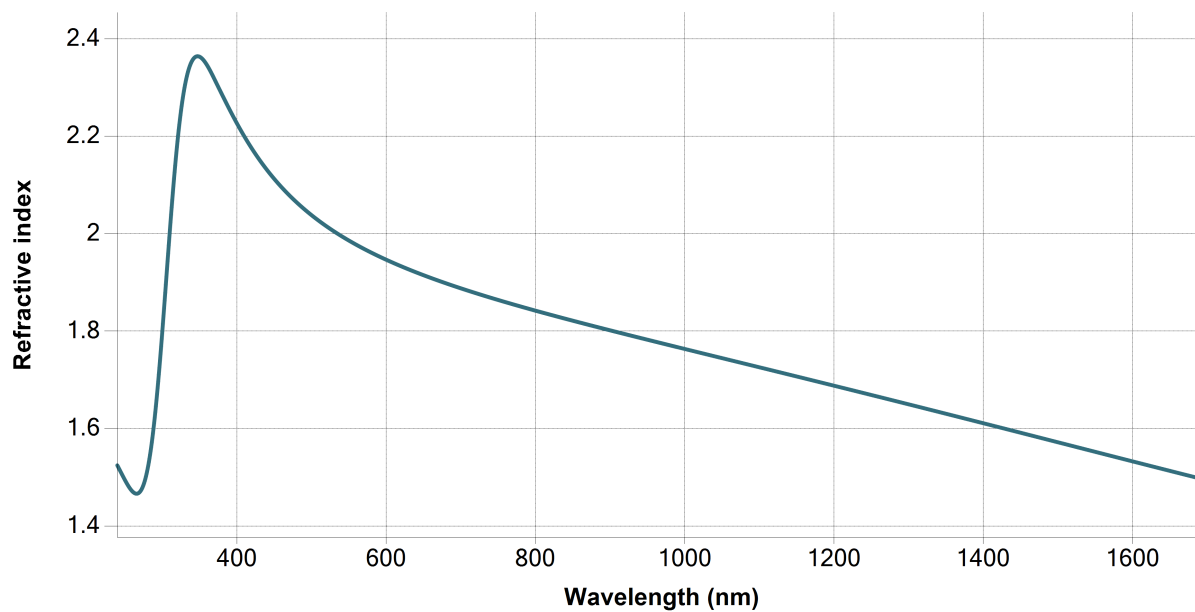
Regression graphs



Phase 2 (ITO + void) - Dispersion graphs



Phase 1 (ITO) - Dispersion graphs



Substrate (si) - Dispersion graphs



Correlation coefficients	
Ph2 - ITO + void - Thickness --- Ph1 - ITO - Thickness	-0.4499
Ph2 - ITO + void - Thickness --- Ph1 - Tauc-Lorentz[1] - C (eV)	-0.0408
Ph2 - ITO + void - Thickness --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	0.0341
Ph2 - ITO + void - Thickness --- Ph1 - Drude[2] - E _p (eV)	-0.3456
Ph2 - ITO + void - Thickness --- Ph1 - Drude[2] - E _Γ (eV)	-0.0979
Ph2 - ITO + void - Thickness --- Ph1 - Lorentz[3] - f	0.0481
Ph2 - ITO + void - Thickness --- Ph1 - Lorentz[3] - E0 (eV)	-0.2038
Ph1 - ITO - Thickness --- Ph1 - Tauc-Lorentz[1] - C (eV)	-0.1524
Ph1 - ITO - Thickness --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	0.2265
Ph1 - ITO - Thickness --- Ph1 - Drude[2] - E _p (eV)	0.504
Ph1 - ITO - Thickness --- Ph1 - Drude[2] - E _Γ (eV)	0.6571
Ph1 - ITO - Thickness --- Ph1 - Lorentz[3] - f	0.0023
Ph1 - ITO - Thickness --- Ph1 - Lorentz[3] - E0 (eV)	0.474
Ph1 - Tauc-Lorentz[1] - C (eV) --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	-0.9792
Ph1 - Tauc-Lorentz[1] - C (eV) --- Ph1 - Drude[2] - E _p (eV)	-0.4464
Ph1 - Tauc-Lorentz[1] - C (eV) --- Ph1 - Drude[2] - E _Γ (eV)	-0.0068
Ph1 - Tauc-Lorentz[1] - C (eV) --- Ph1 - Lorentz[3] - f	-0.6927
Ph1 - Tauc-Lorentz[1] - C (eV) --- Ph1 - Lorentz[3] - E0 (eV)	-0.3939
Ph1 - Tauc-Lorentz[1] - Eg (eV) --- Ph1 - Drude[2] - E _p (eV)	0.3953
Ph1 - Tauc-Lorentz[1] - Eg (eV) --- Ph1 - Drude[2] - E _Γ (eV)	0.0583
Ph1 - Tauc-Lorentz[1] - Eg (eV) --- Ph1 - Lorentz[3] - f	0.7958
Ph1 - Tauc-Lorentz[1] - Eg (eV) --- Ph1 - Lorentz[3] - E0 (eV)	0.5073
Ph1 - Drude[2] - E _p (eV) --- Ph1 - Drude[2] - E _Γ (eV)	0.2589
Ph1 - Drude[2] - E _p (eV) --- Ph1 - Lorentz[3] - f	0.0901
Ph1 - Drude[2] - E _p (eV) --- Ph1 - Lorentz[3] - E0 (eV)	0.359
Ph1 - Drude[2] - E _Γ (eV) --- Ph1 - Lorentz[3] - f	-0.1511
Ph1 - Drude[2] - E _Γ (eV) --- Ph1 - Lorentz[3] - E0 (eV)	0.1352
Ph1 - Lorentz[3] - f --- Ph1 - Lorentz[3] - E0 (eV)	0.6594