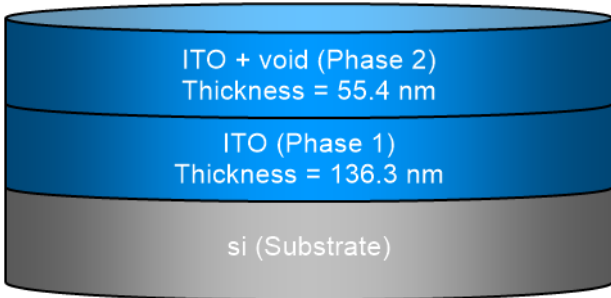


SEA regression report summary

Sample ID
001f-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 14:10
Comments	

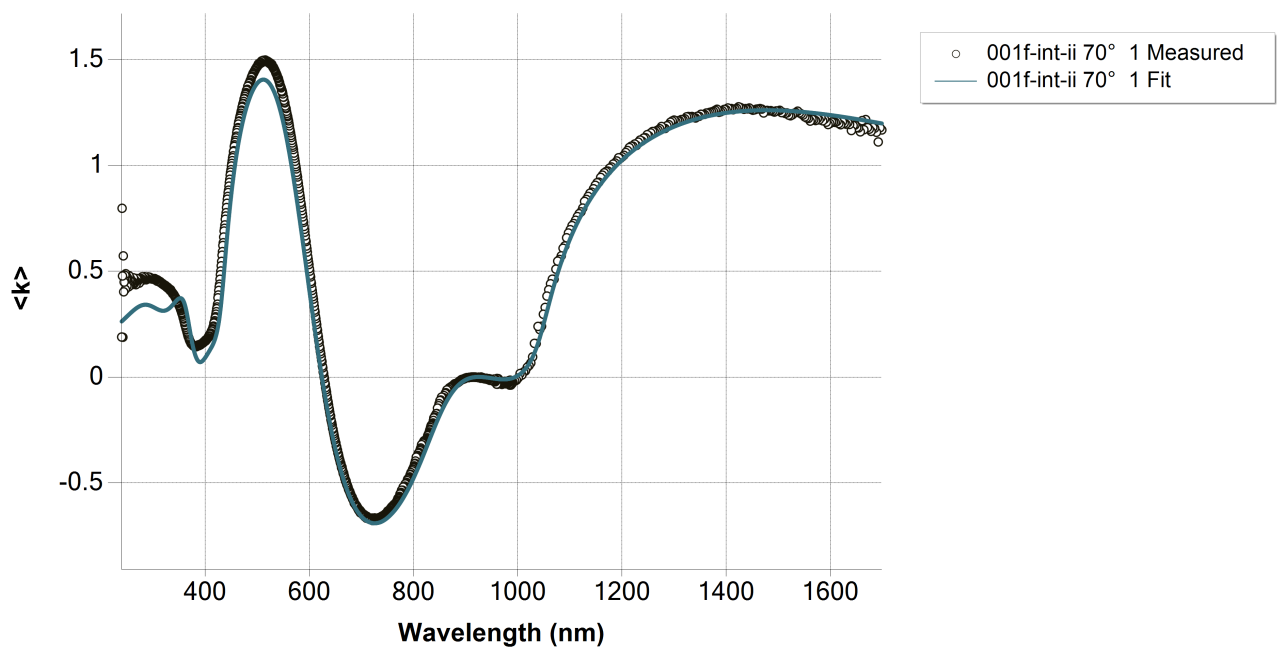
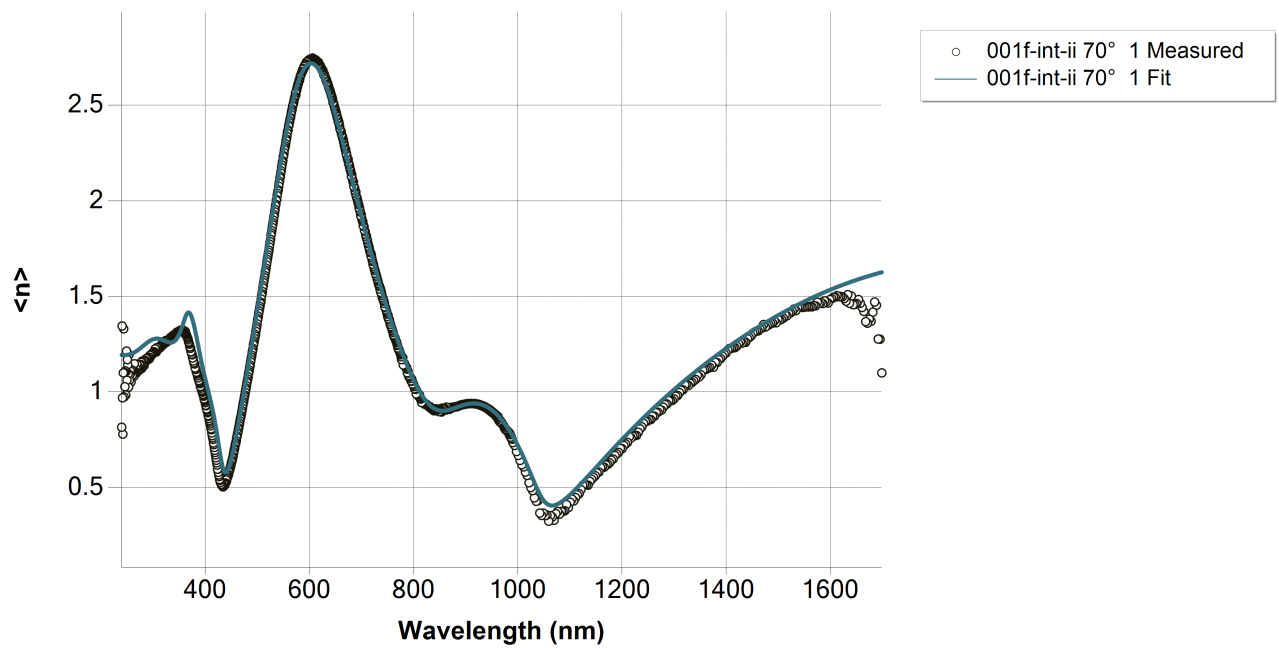
Layer structure	
Overview	
	
Optical model	
Phase 2	ITO + void
Diffusion	
Phase 1	ITO
Dispersion law	Tauc-Lorentz
	Drude
	Lorentz

Regression results

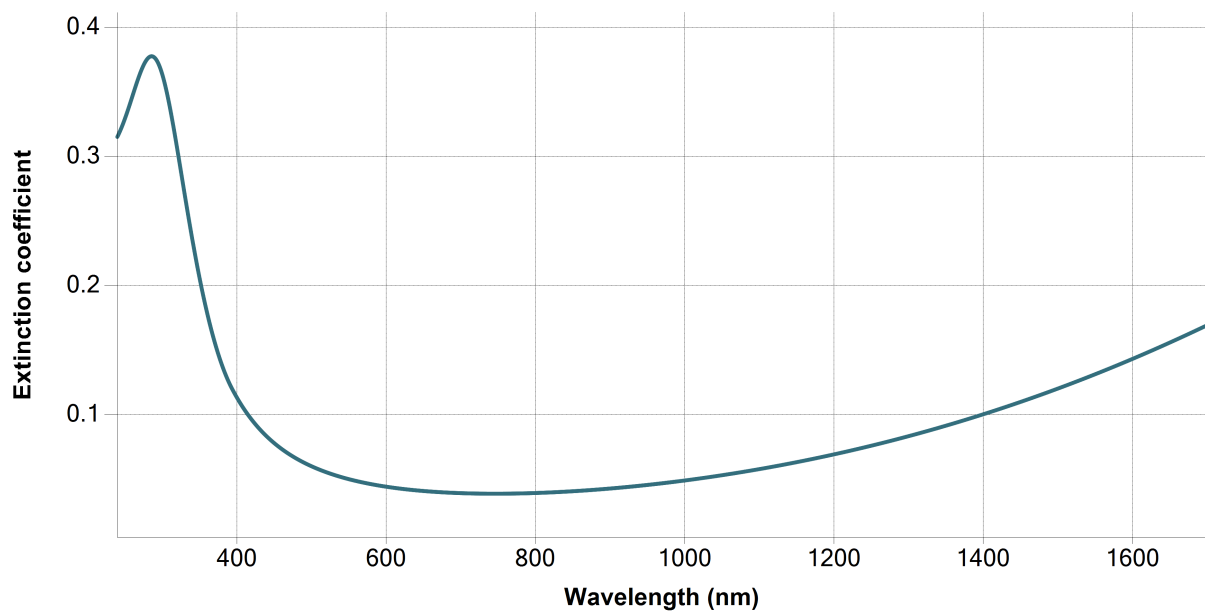
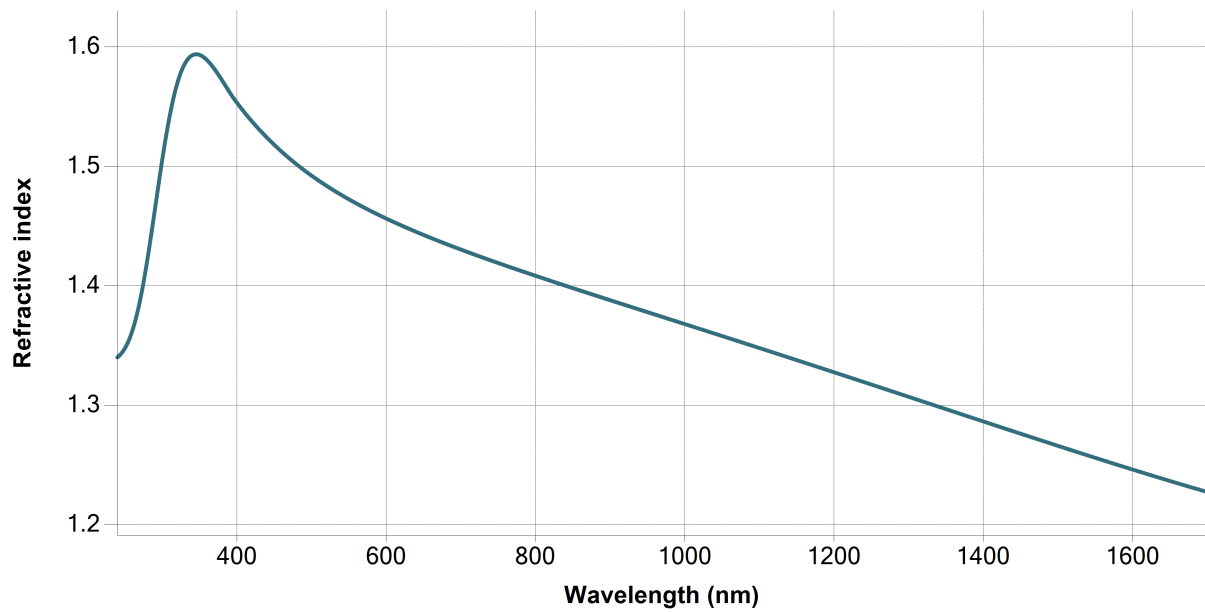
Measurement information				
Measurement file path	C:\Users\emmabat\lito-sil\001f-int-ii.smdx			
Angle of Incidence	70°			
Regression details				
Regression 1 (EllipsoReflectance)				
Wavelength range	239.84 - 1698.83 nm			
Angle of Incidence	70°			
Fit to	<n>, <k>			
Angular Aperture	0°			
Fit algorithm	LMA			
Results				
Parameters	Value	Fitted	2 σ confidence limit	Unit
Model				
AOI Shift	0			°
Angular Aperture	0			°
Phase 2 (ITO + void)				
Thickness	55.42	X	0.41781	nm
Depolarization coefficient	0.33333			
Concentration 1	0.5			
Concentration 2	0.5			
Phase 1 (ITO)				
Thickness	136.298	X	1.16575	nm
A (eV)	499.9547			eV
E0 (eV)	6.0053			eV
C (eV)	61.46965			eV
Eg (eV)	3.14759	X	0.05142	eV
E_p (eV)	1.10236	X	0.011393	eV
E_Γ (eV)	0.41338	X	0.020103	eV
f	1.00917	X	0.042565	
E0 (eV)	4.12575	X	0.045745	eV
Γ (eV)	1.58246	X	0.051415	eV
Eps_inf	0			
Derived parameters	Value			
Phase 2 (ITO + void)				
n @ 632.8 nm	1.4471			
k @ 632.8 nm	0.0418			
Phase 1 (ITO)				
n @ 632.8 nm	1.9423			
k @ 632.8 nm	0.0912			
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)	3.9544E+04 ± 2740.4364			S/m

Resistivity (mΩ.cm)	2.5288 ± 0.1752	mΩ.cm
Resistance (Ω/sq)	185.5357 ± 14.4446	Ω/sq
N type dopant concentration (at/cm ³)	$2.2033\text{E}+20 \pm 4.5543\text{E}+18$	at/cm ³
P type dopant concentration (at/cm ³)	$3.2609\text{E}+20 \pm 6.7403\text{E}+18$	at/cm ³
N type dopant mobility (cm ² /Vs)	11.202 ± 0.8101	cm ² /Vs
P type dopant mobility (cm ² /Vs)	7.5689 ± 0.5474	cm ² /Vs
Fit quality		
R ²	0.9882	
RMSE	0.06967	

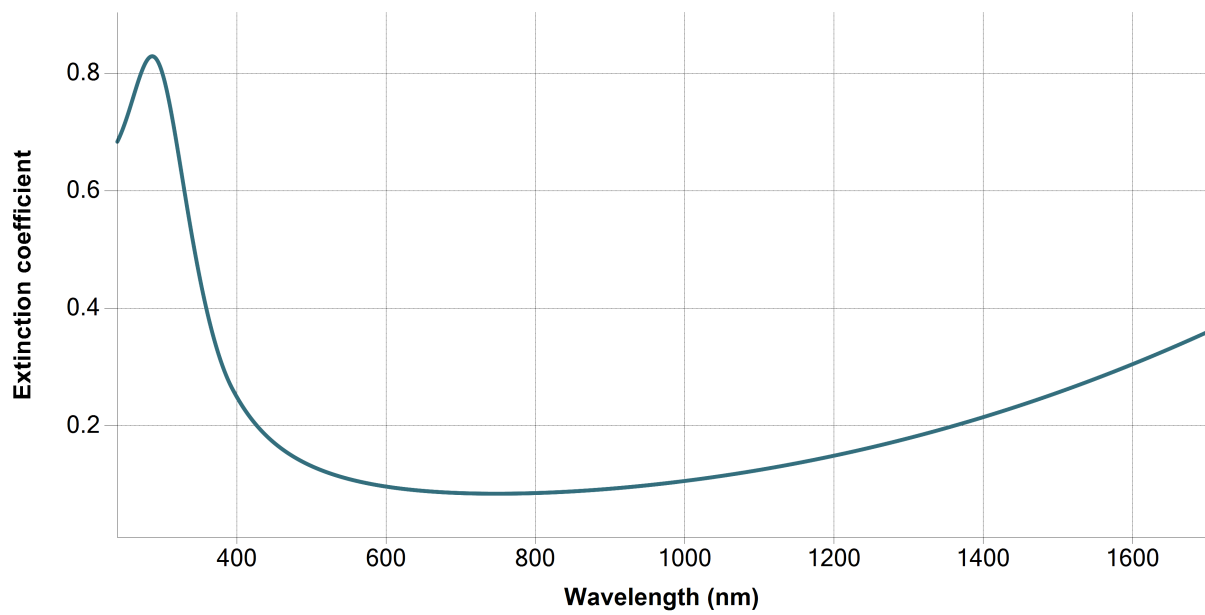
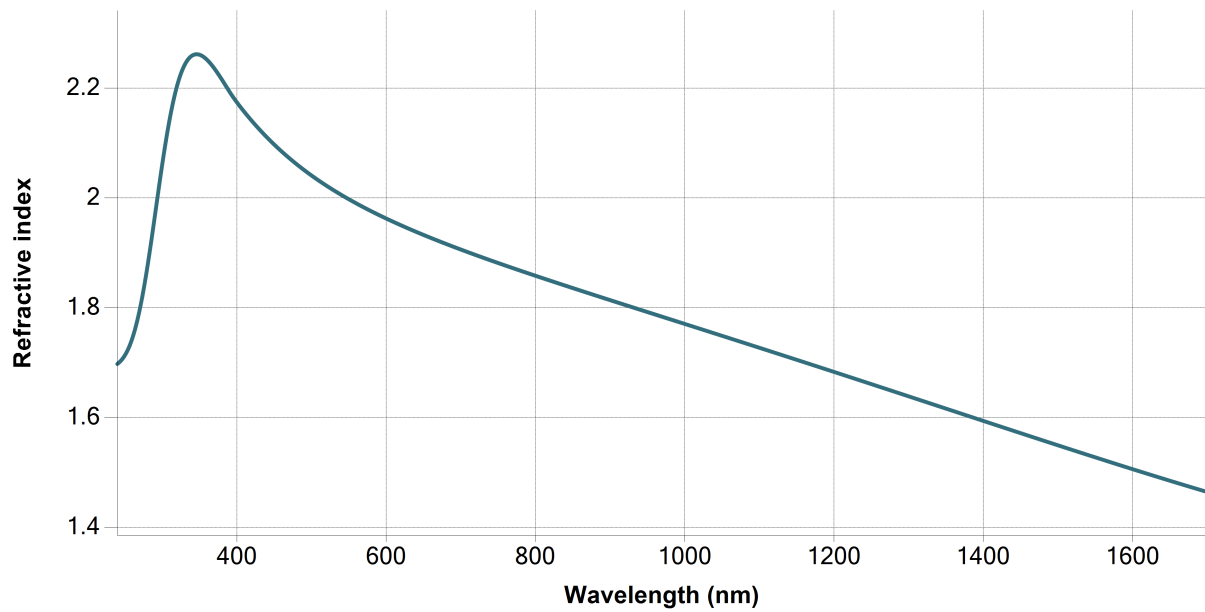
Regression graphs



Phase 2 (ITO + void) - Dispersion graphs



Phase 1 (ITO) - Dispersion graphs



Substrate (si) - Dispersion graphs



Correlation coefficients	
Ph2 - ITO + void - Thickness --- Ph1 - ITO - Thickness	-0.3942
Ph2 - ITO + void - Thickness --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	-0.0348
Ph2 - ITO + void - Thickness --- Ph1 - Drude[2] - E _p (eV)	-0.3987
Ph2 - ITO + void - Thickness --- Ph1 - Drude[2] - E _Γ (eV)	-0.0319
Ph2 - ITO + void - Thickness --- Ph1 - Lorentz[3] - f	-0.0267
Ph2 - ITO + void - Thickness --- Ph1 - Lorentz[3] - E0 (eV)	-0.2501
Ph1 - ITO - Thickness --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	0.4185
Ph1 - ITO - Thickness --- Ph1 - Drude[2] - E _p (eV)	0.44
Ph1 - ITO - Thickness --- Ph1 - Drude[2] - E _Γ (eV)	0.5425
Ph1 - ITO - Thickness --- Ph1 - Lorentz[3] - f	-0.0006
Ph1 - ITO - Thickness --- Ph1 - Lorentz[3] - E0 (eV)	0.4459
Ph1 - Tauc-Lorentz[1] - Eg (eV) --- Ph1 - Drude[2] - E _p (eV)	-0.2161
Ph1 - Tauc-Lorentz[1] - Eg (eV) --- Ph1 - Drude[2] - E _Γ (eV)	0.1993
Ph1 - Tauc-Lorentz[1] - Eg (eV) --- Ph1 - Lorentz[3] - f	0.8709
Ph1 - Tauc-Lorentz[1] - Eg (eV) --- Ph1 - Lorentz[3] - E0 (eV)	0.7442
Ph1 - Drude[2] - E _p (eV) --- Ph1 - Drude[2] - E _Γ (eV)	0.1921
Ph1 - Drude[2] - E _p (eV) --- Ph1 - Lorentz[3] - f	-0.2815
Ph1 - Drude[2] - E _p (eV) --- Ph1 - Lorentz[3] - E0 (eV)	0.1594
Ph1 - Drude[2] - E _Γ (eV) --- Ph1 - Lorentz[3] - f	-0.1477
Ph1 - Drude[2] - E _Γ (eV) --- Ph1 - Lorentz[3] - E0 (eV)	0.0256
Ph1 - Lorentz[3] - f --- Ph1 - Lorentz[3] - E0 (eV)	0.7312