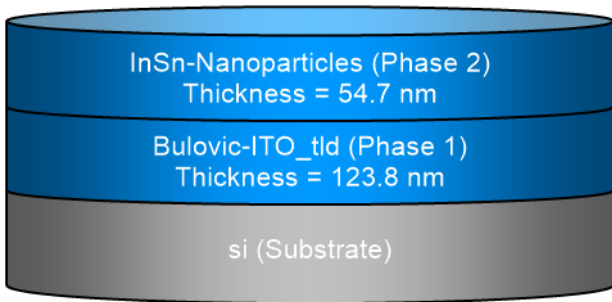


SEA regression report summary

Sample ID
001d-int-ii 70° 1
001d-int-ii 65° 2
001d-int-ii 60° 3

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	26-08-2021 16:00
Comments	

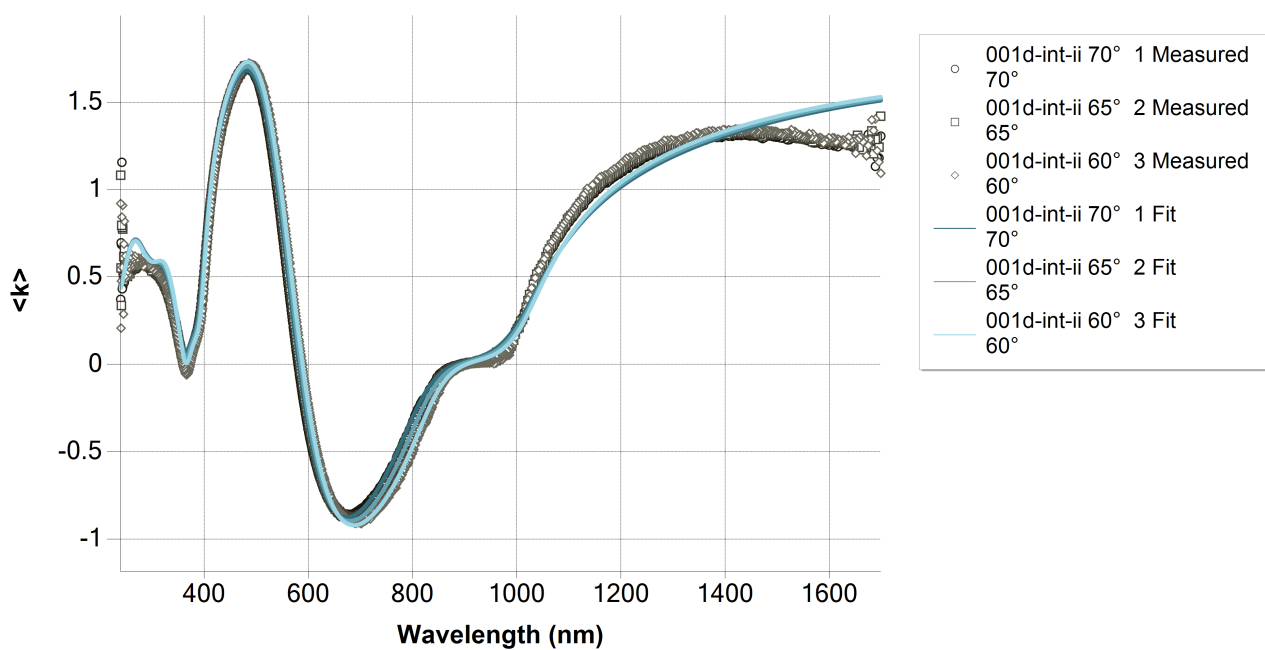
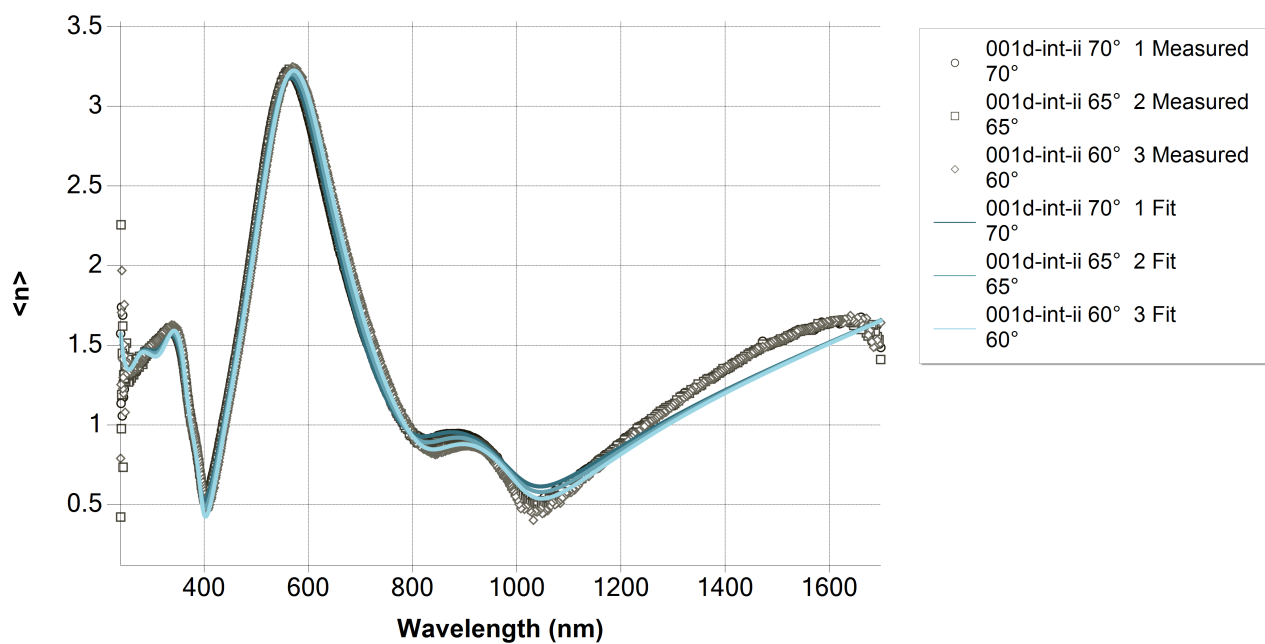
Layer structure	
Overview	
 <p>The diagram illustrates a three-layer structure. The top layer is labeled 'InSn-Nanoparticles (Phase 2)' with a thickness of 54.7 nm. The middle layer is labeled 'Bulovic-ITO_tld (Phase 1)' with a thickness of 123.8 nm. The bottom layer is labeled 'si (Substrate)'.</p>	
Optical model	
Phase 2	InSn-Nanoparticles
Dispersion law	Lorentz
	Lorentz
Phase 1	Bulovic-ITO_tld
Dispersion law	Tauc-Lorentz
	Drude

Regression results

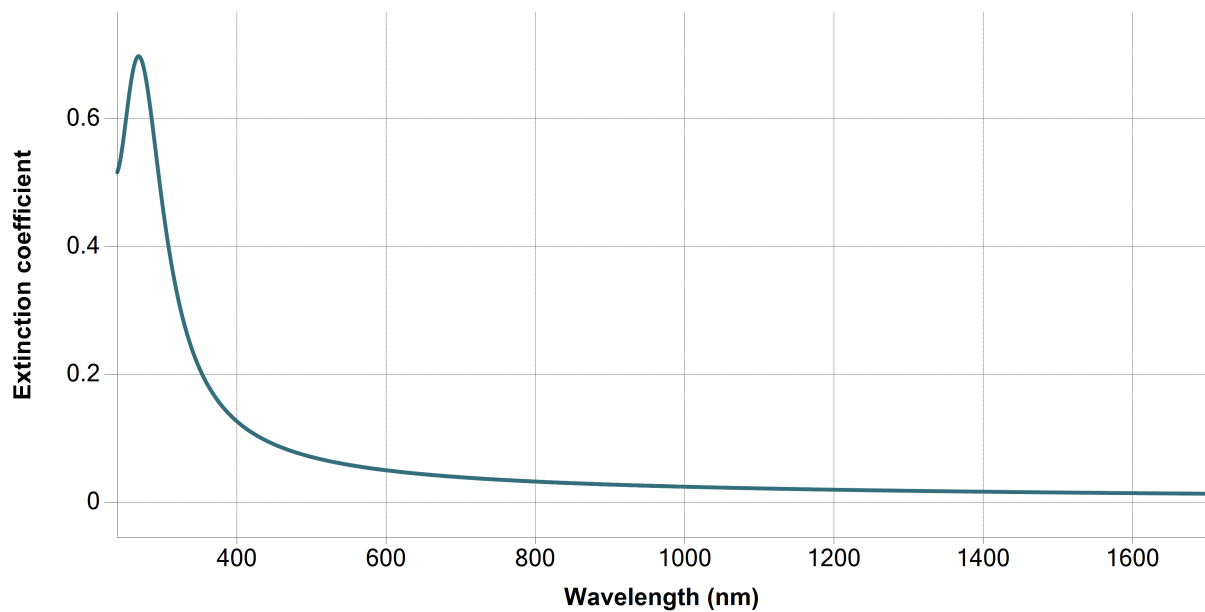
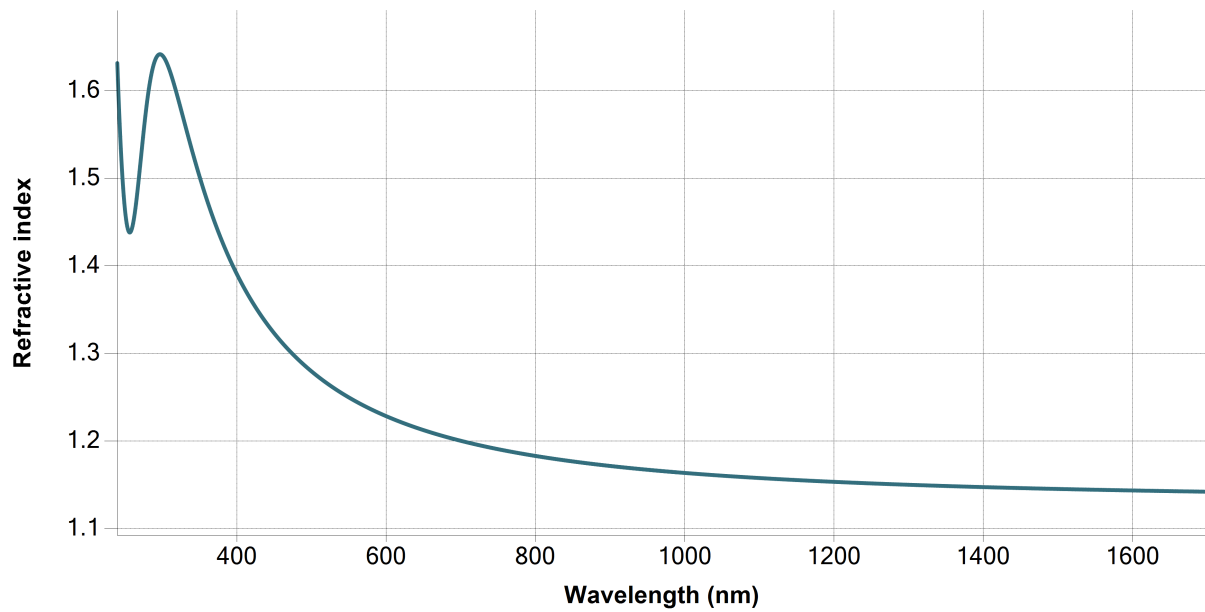
Measurement information				
Measurement 1				
Measurement file path	C:\Users\emmabat\ito-si\001d-int-ii.smdx			
Angle of Incidence	70°			
Measurement 2				
Measurement file path	C:\Users\emmabat\ito-si\001d-int-ii.smdx			
Angle of Incidence	65°			
Measurement 3				
Measurement file path	C:\Users\emmabat\ito-si\001d-int-ii.smdx			
Angle of Incidence	60°			
Regression details				
Regression 1 (EllipsoReflectance)				
Wavelength range	239.84 - 1698.83 nm			
Angle of Incidence	70°			
Fit to	<n>, <k>			
Regression 2 (EllipsoReflectance)				
Wavelength range	239.84 - 1698.83 nm			
Angle of Incidence	65°			
Fit to	<n>, <k>			
Regression 3 (EllipsoReflectance)				
Wavelength range	239.84 - 1698.83 nm			
Angle of Incidence	60°			
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 (InSn-Nanoparticles)				
Thickness	54.679	X	0.54881	nm
f	0.51959	X	0.027756	
E0 (eV)	4.5448	X	0.023075	eV
Γ (eV)	1.25014	X	0.047934	eV
f	0.75991	X	0.035794	
E0 (eV)	5.86064	X	0.038262	eV
Γ (eV)	0.36672	X	0.08332	eV
Eps_inf	0			
Phase 1 (Bulovic-ITO_tld)				
Thickness	123.798	X	0.31587	nm
A (eV)	111.41549	X	9.15428	eV
E0 (eV)	12.48408	X	0.91064	eV
C (eV)	22.10963	X	4.00048	eV
Eg (eV)	1.72786	X	0.022605	eV

E_p (eV)	0.80466	X	0.011235	eV
E_Γ (eV)	0			eV
Eps_inf	0			
Derived parameters	Value			
Phase 2 (InSn-Nanoparticles)				
n @ 632.8 nm	1.2174			
k @ 632.8 nm	0.0457			
Phase 1 (Bulovic-ITO_tld)				
n @ 632.8 nm	2.0642			
k @ 632.8 nm	0.0082			
Substrate (si)				
n @ 632.8 nm	3.8811			
k @ 632.8 nm	0.0195			
Drude derived parameters	Value			Unit
Phase 1 (Bulovic-ITO_tld)				
Conductivity (S/m)	∞ ± NaN			S/m
Resistivity (mΩ.cm)	0 ± NaN			mΩ.cm
Resistance (Ω/sq)	0 ± NaN			Ω/sq
N type dopant concentration (at/cm3)	1.1739E+20 ± 3.2783E+18			at/cm3
P type dopant concentration (at/cm3)	1.7374E+20 ± 4.8518E+18			at/cm3
N type dopant mobility (cm2/Vs)	∞ ± NaN			cm2/Vs
P type dopant mobility (cm2/Vs)	∞ ± NaN			cm2/Vs
Fit quality				
R^2	0.99255			
RMSE	0.06582			

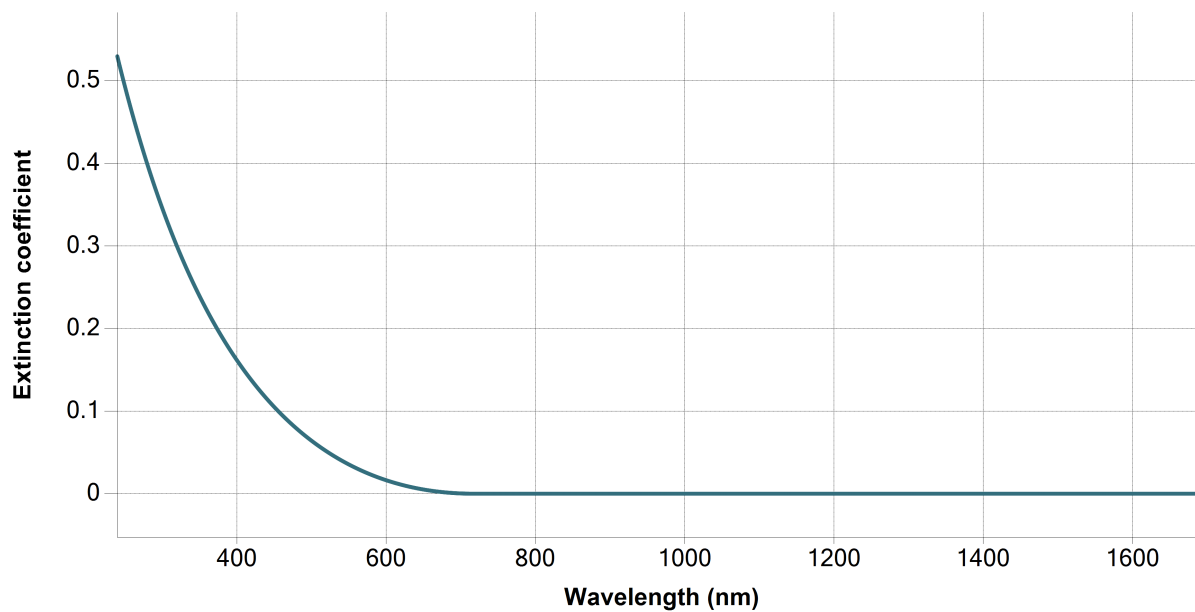
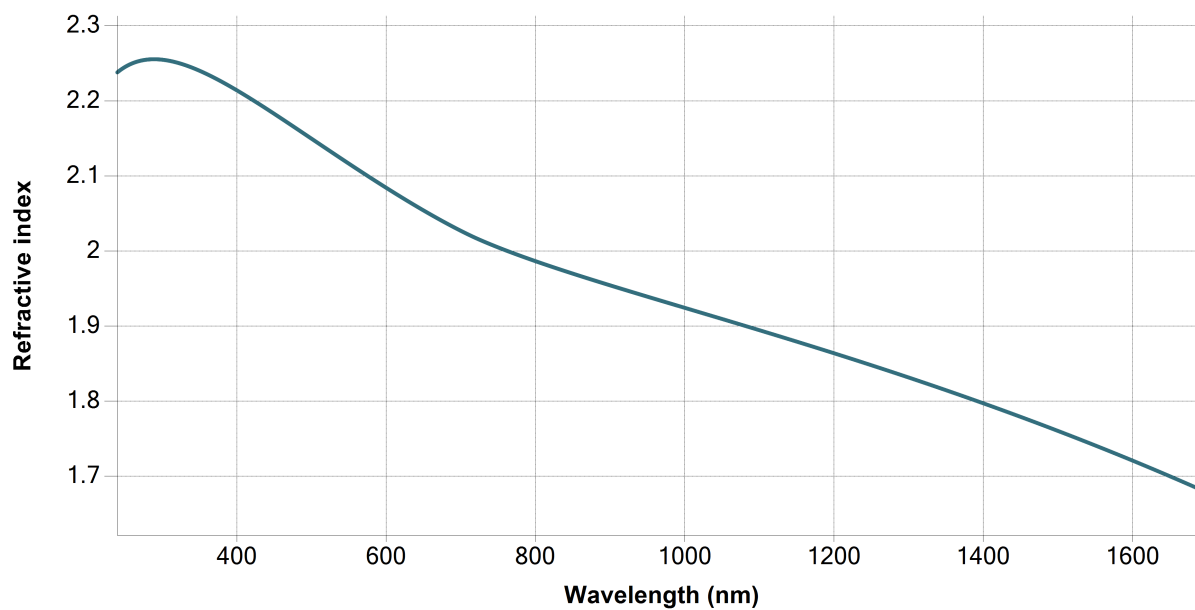
Regression graphs



Phase 2 (InSn-Nanoparticles) - Dispersion graphs



Phase 1 (Bulovic-ITO_tld) - Dispersion graphs



Substrate (si) - Dispersion graphs



Correlation coefficients	
Ph2 - InSn-Nanoparticles - Thickness --- Ph2 - Lorentz[1] - f	0.415
Ph2 - InSn-Nanoparticles - Thickness --- Ph2 - Lorentz[1] - E0 (eV)	0.3029
Ph2 - InSn-Nanoparticles - Thickness --- Ph2 - Lorentz[1] - Γ (eV)	0.4561
Ph2 - InSn-Nanoparticles - Thickness --- Ph2 - Lorentz[2] - f	-0.6489
Ph2 - InSn-Nanoparticles - Thickness --- Ph2 - Lorentz[2] - E0 (eV)	-0.5822
Ph2 - InSn-Nanoparticles - Thickness --- Ph2 - Lorentz[2] - Γ (eV)	-0.3337
Ph2 - InSn-Nanoparticles - Thickness --- Ph1 - Bulovic-ITO_tld - Thickness	0.6339
Ph2 - InSn-Nanoparticles - Thickness --- Ph1 - Tauc-Lorentz[1] - A (eV)	0.6733
Ph2 - InSn-Nanoparticles - Thickness --- Ph1 - Tauc-Lorentz[1] - E0 (eV)	0.7177
Ph2 - InSn-Nanoparticles - Thickness --- Ph1 - Tauc-Lorentz[1] - C (eV)	0.6934
Ph2 - InSn-Nanoparticles - Thickness --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	0.424
Ph2 - Lorentz[1] - f --- Ph2 - Lorentz[1] - E0 (eV)	0.8944
Ph2 - Lorentz[1] - f --- Ph2 - Lorentz[1] - Γ (eV)	0.8616
Ph2 - Lorentz[1] - f --- Ph2 - Lorentz[2] - f	-0.9372
Ph2 - Lorentz[1] - f --- Ph2 - Lorentz[2] - E0 (eV)	-0.7448
Ph2 - Lorentz[1] - f --- Ph2 - Lorentz[2] - Γ (eV)	-0.9509
Ph2 - Lorentz[1] - f --- Ph1 - Bulovic-ITO_tld - Thickness	0.2762
Ph2 - Lorentz[1] - f --- Ph1 - Tauc-Lorentz[1] - A (eV)	0.5416
Ph2 - Lorentz[1] - f --- Ph1 - Tauc-Lorentz[1] - E0 (eV)	0.568
Ph2 - Lorentz[1] - f --- Ph1 - Tauc-Lorentz[1] - C (eV)	0.5425
Ph2 - Lorentz[1] - f --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	0.4208
Ph2 - Lorentz[1] - E0 (eV) --- Ph2 - Lorentz[1] - Γ (eV)	0.8558
Ph2 - Lorentz[1] - E0 (eV) --- Ph2 - Lorentz[2] - f	-0.7974
Ph2 - Lorentz[1] - E0 (eV) --- Ph2 - Lorentz[2] - E0 (eV)	-0.5364
Ph2 - Lorentz[1] - E0 (eV) --- Ph2 - Lorentz[2] - Γ (eV)	-0.8267
Ph2 - Lorentz[1] - E0 (eV) --- Ph1 - Bulovic-ITO_tld - Thickness	0.2165
Ph2 - Lorentz[1] - E0 (eV) --- Ph1 - Tauc-Lorentz[1] - A (eV)	0.4461
Ph2 - Lorentz[1] - E0 (eV) --- Ph1 - Tauc-Lorentz[1] - E0 (eV)	0.4631
Ph2 - Lorentz[1] - E0 (eV) --- Ph1 - Tauc-Lorentz[1] - C (eV)	0.4402
Ph2 - Lorentz[1] - E0 (eV) --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	0.3944
Ph2 - Lorentz[1] - Γ (eV) --- Ph2 - Lorentz[2] - f	-0.7822
Ph2 - Lorentz[1] - Γ (eV) --- Ph2 - Lorentz[2] - E0 (eV)	-0.5244
Ph2 - Lorentz[1] - Γ (eV) --- Ph2 - Lorentz[2] - Γ (eV)	-0.7429
Ph2 - Lorentz[1] - Γ (eV) --- Ph1 - Bulovic-ITO_tld - Thickness	0.2218
Ph2 - Lorentz[1] - Γ (eV) --- Ph1 - Tauc-Lorentz[1] - A (eV)	0.6702
Ph2 - Lorentz[1] - Γ (eV) --- Ph1 - Tauc-Lorentz[1] - E0 (eV)	0.6757
Ph2 - Lorentz[1] - Γ (eV) --- Ph1 - Tauc-Lorentz[1] - C (eV)	0.6569
Ph2 - Lorentz[1] - Γ (eV) --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	0.6493
Ph2 - Lorentz[2] - f --- Ph2 - Lorentz[2] - E0 (eV)	0.8706
Ph2 - Lorentz[2] - f --- Ph2 - Lorentz[2] - Γ (eV)	0.9012

Ph2 - Lorentz[2] - f --- Ph1 - Bulovic-ITO_tld - Thickness	-0.524
Ph2 - Lorentz[2] - f --- Ph1 - Tauc-Lorentz[1] - A (eV)	-0.6224
Ph2 - Lorentz[2] - f --- Ph1 - Tauc-Lorentz[1] - E0 (eV)	-0.6696
Ph2 - Lorentz[2] - f --- Ph1 - Tauc-Lorentz[1] - C (eV)	-0.6355
Ph2 - Lorentz[2] - f --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	-0.391
Ph2 - Lorentz[2] - E0 (eV) --- Ph2 - Lorentz[2] - Γ (eV)	0.7653
Ph2 - Lorentz[2] - E0 (eV) --- Ph1 - Bulovic-ITO_tld - Thickness	-0.5443
Ph2 - Lorentz[2] - E0 (eV) --- Ph1 - Tauc-Lorentz[1] - A (eV)	-0.4972
Ph2 - Lorentz[2] - E0 (eV) --- Ph1 - Tauc-Lorentz[1] - E0 (eV)	-0.5533
Ph2 - Lorentz[2] - E0 (eV) --- Ph1 - Tauc-Lorentz[1] - C (eV)	-0.5192
Ph2 - Lorentz[2] - E0 (eV) --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	-0.2112
Ph2 - Lorentz[2] - Γ (eV) --- Ph1 - Bulovic-ITO_tld - Thickness	-0.2859
Ph2 - Lorentz[2] - Γ (eV) --- Ph1 - Tauc-Lorentz[1] - A (eV)	-0.4053
Ph2 - Lorentz[2] - Γ (eV) --- Ph1 - Tauc-Lorentz[1] - E0 (eV)	-0.4415
Ph2 - Lorentz[2] - Γ (eV) --- Ph1 - Tauc-Lorentz[1] - C (eV)	-0.4145
Ph2 - Lorentz[2] - Γ (eV) --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	-0.24
Ph1 - Bulovic-ITO_tld - Thickness --- Ph1 - Tauc-Lorentz[1] - A (eV)	0.382
Ph1 - Bulovic-ITO_tld - Thickness --- Ph1 - Tauc-Lorentz[1] - E0 (eV)	0.4725
Ph1 - Bulovic-ITO_tld - Thickness --- Ph1 - Tauc-Lorentz[1] - C (eV)	0.4293
Ph1 - Bulovic-ITO_tld - Thickness --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	0.0288
Ph1 - Tauc-Lorentz[1] - A (eV) --- Ph1 - Tauc-Lorentz[1] - E0 (eV)	0.9879
Ph1 - Tauc-Lorentz[1] - A (eV) --- Ph1 - Tauc-Lorentz[1] - C (eV)	0.9973
Ph1 - Tauc-Lorentz[1] - A (eV) --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	0.8382
Ph1 - Tauc-Lorentz[1] - E0 (eV) --- Ph1 - Tauc-Lorentz[1] - C (eV)	0.994
Ph1 - Tauc-Lorentz[1] - E0 (eV) --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	0.757
Ph1 - Tauc-Lorentz[1] - C (eV) --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	0.8004