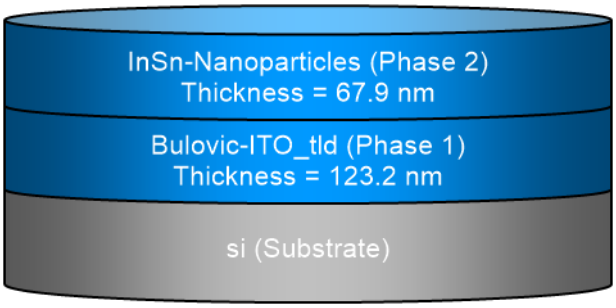
SEA regression report summary

Sample ID
001e-int-i 70° 1
001e-int-i 65° 2
001e-int-i 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 16:02
Comments	

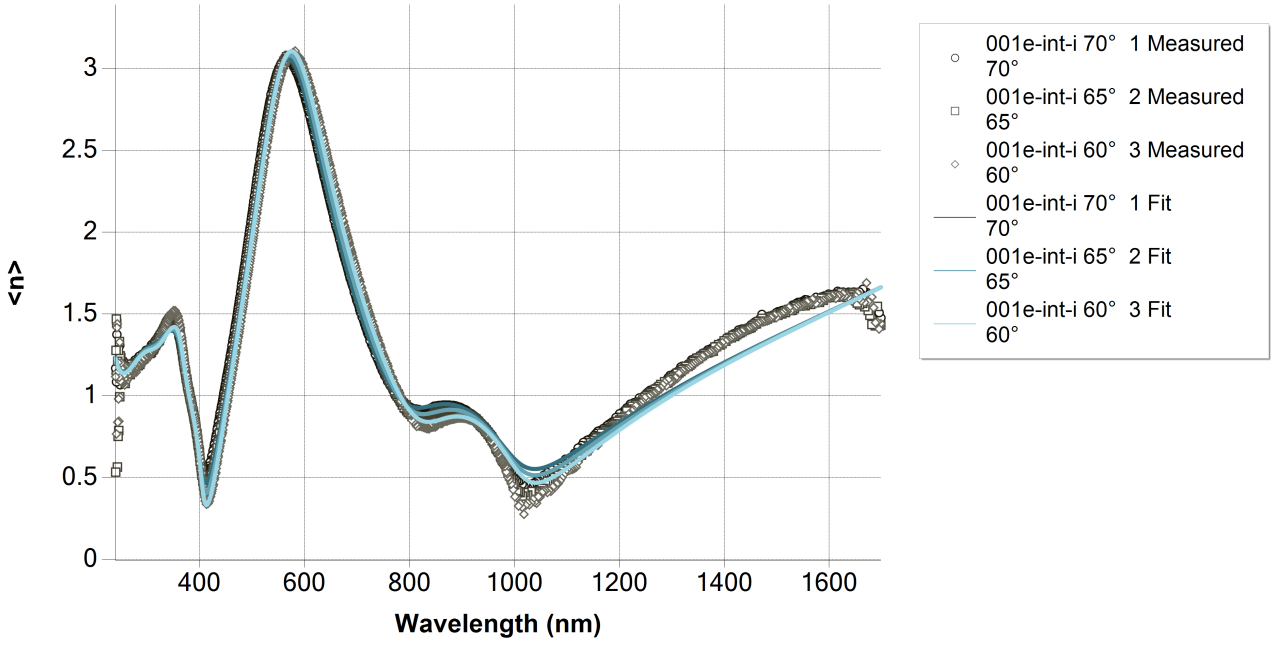
Layer structure	
Overview	
	
Optical model	
Phase 2	InSn-Nanoparticles
Dispersion law	Lorentz
	Lorentz
Phase 1	Bulovic-ITO_tld
Dispersion law	Tauc-Lorentz
	Drude

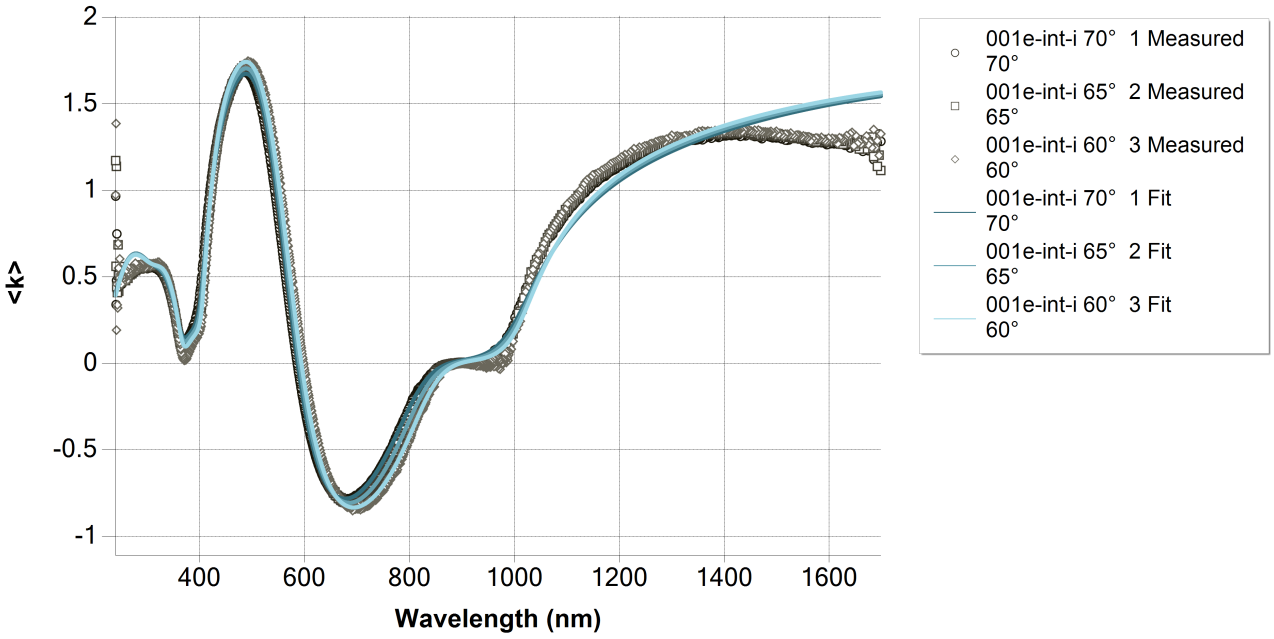
Regression results

Measurement information				
Measurement 1				
Measurement file path	C:\Users\emmabat\ito-si\001e-int-i.smdx			
Angle of Incidence	70°			
Measurement 2				
Measurement file path	C:\Users\emmabat\ito-si\001e-int-i.smdx			
Angle of Incidence	65°			
Measurement 3				
Measurement file path	C:\Users\emmabat\ito-si\001e-int-i.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	67.879	X	0.5277	nm
f	0.52997	X	0.030405	
E0 (eV)	4.3983	X	0.033029	eV
Γ (eV)	1.64765	X	0.054399	eV
f	0.71974	X	0.032716	
E0 (eV)	6.26695	X	0.061544	eV
Γ (eV)	0.56498	X	0.16824	eV
Eps_inf	0			
Phase 1 (Bulovic-ITO_tld)				
Thickness	123.205	X	0.31937	nm
A (eV)	180.62602	X	28.01421	eV
E0 (eV)	14.99998	X	1.99106	eV
C (eV)	48.96193	X	15.8898	eV
Eg (eV)	2.05042	X	0.02196	eV

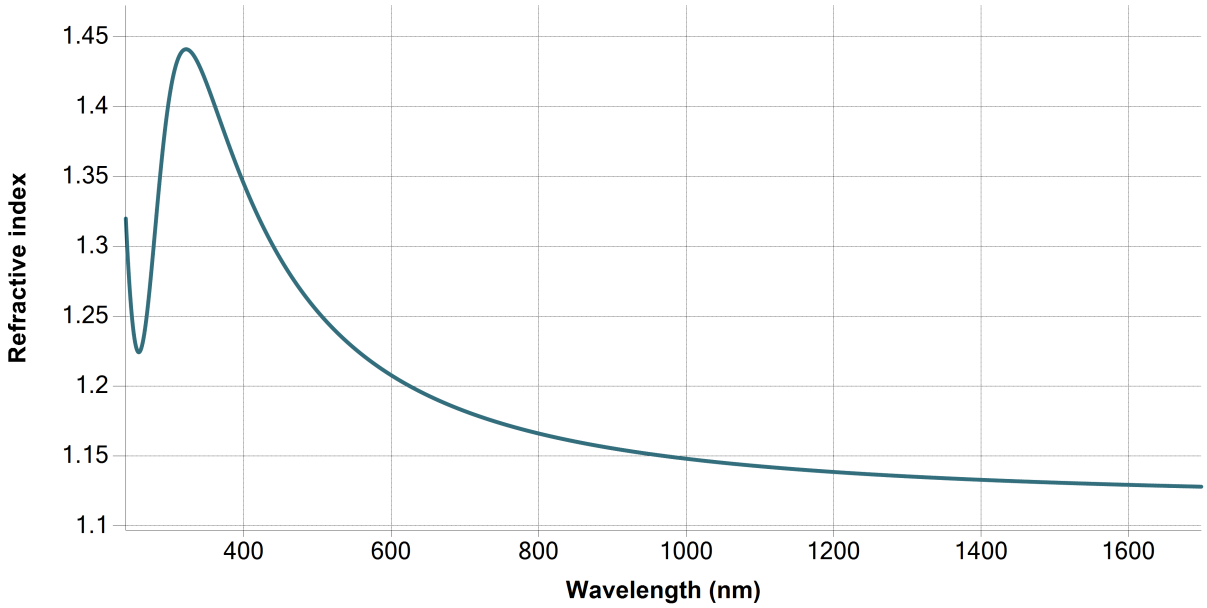
E_p (eV)	0.84506	X	0.010563	eV
E_Γ (eV)	0			eV
Eps_inf	0			
Derived parameters	Value			
Phase 2 (InSn-Nanoparticles)				
n @ 632.8 nm	1.1979			
k @ 632.8 nm	0.0655			
Phase 1 (Bulovic-ITO_tld)				
n @ 632.8 nm	2.0373			
k @ 632.8 nm	0			
Substrate (si)				
n @ 632.8 nm	3.8811			
k @ 632.8 nm	0.0195			
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)	1.2948E+20 ± 3.2368E+18			at/cm3
P type dopant concentration (at/cm3)	1.9163E+20 ± 4.7905E+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	0.99204			
RMSE	0.06596			

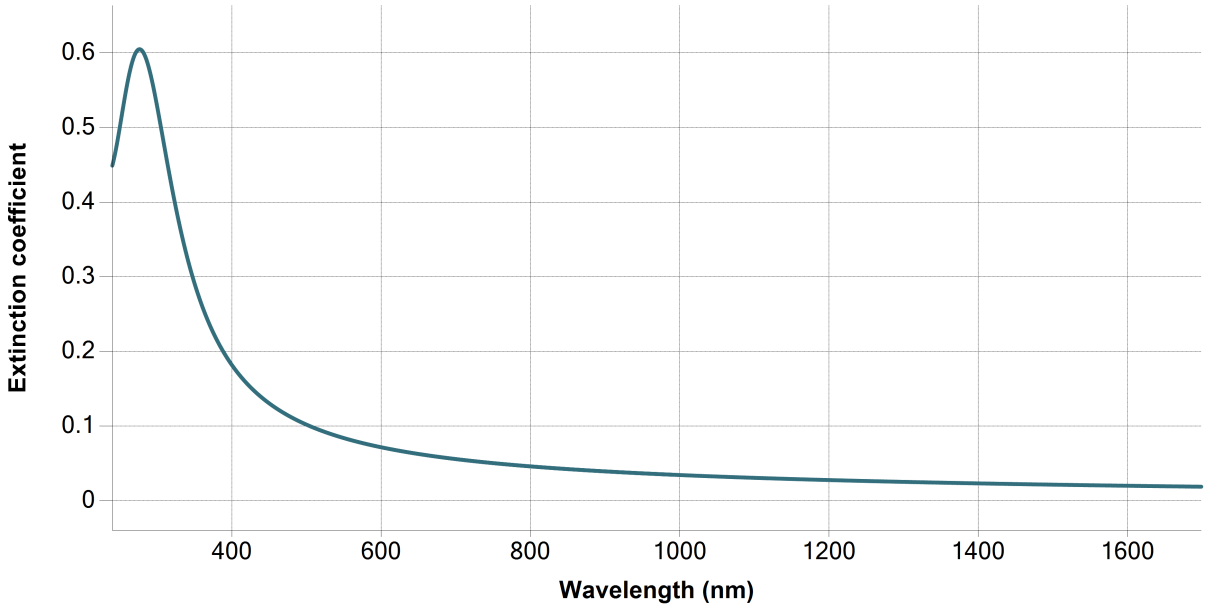
Regression graphs



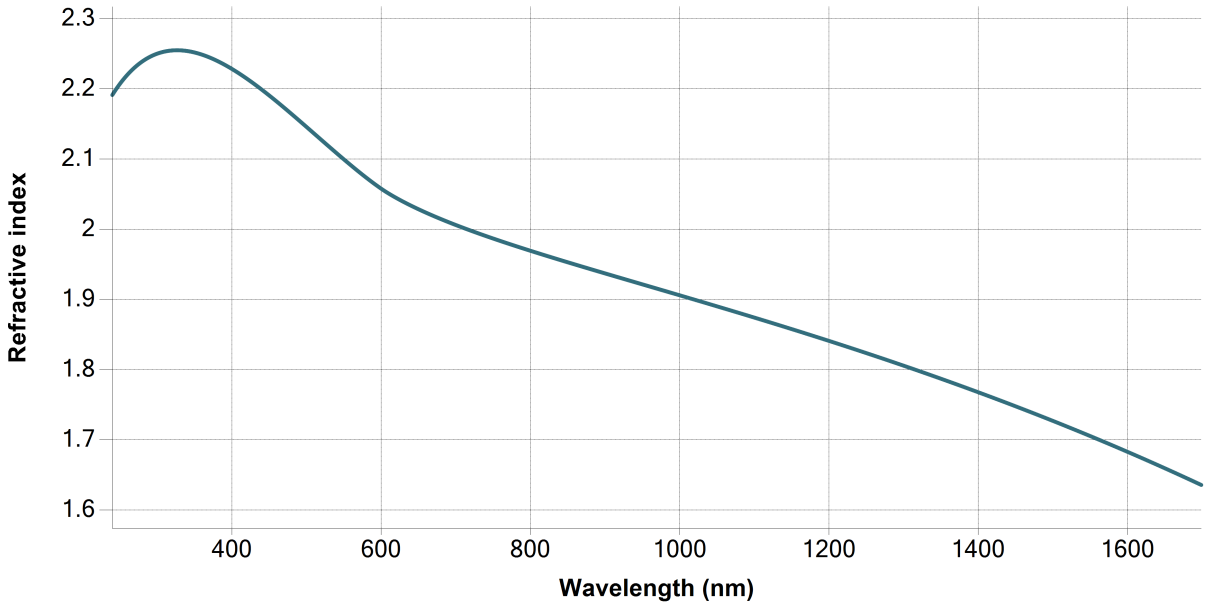


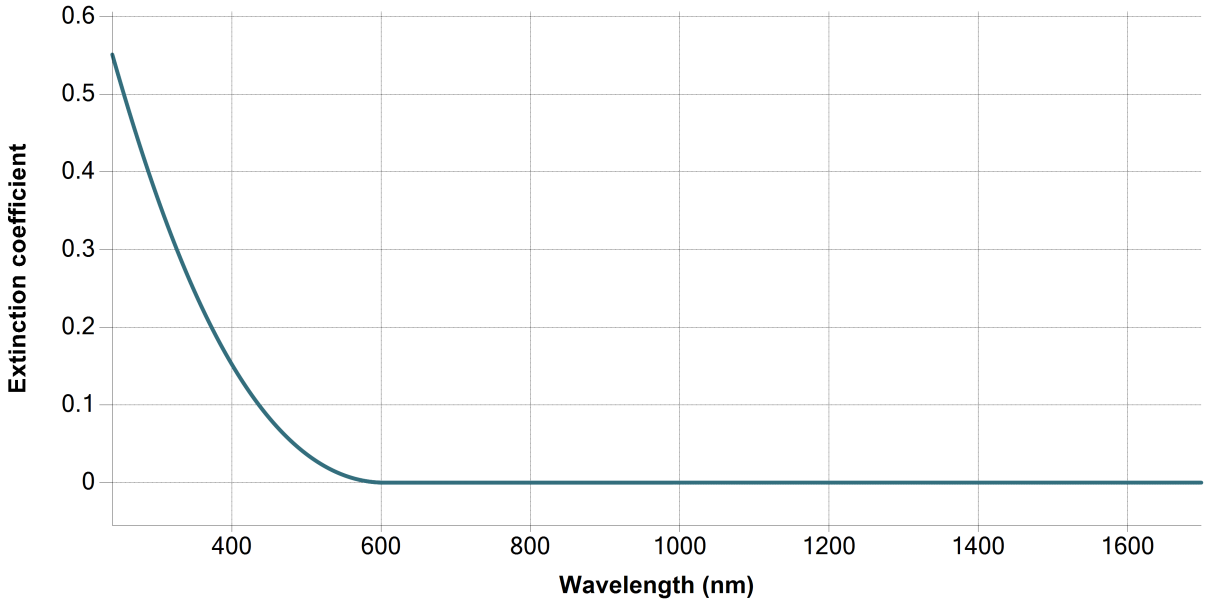
Phase 2 (InSn-Nanoparticles) - Dispersion graphs



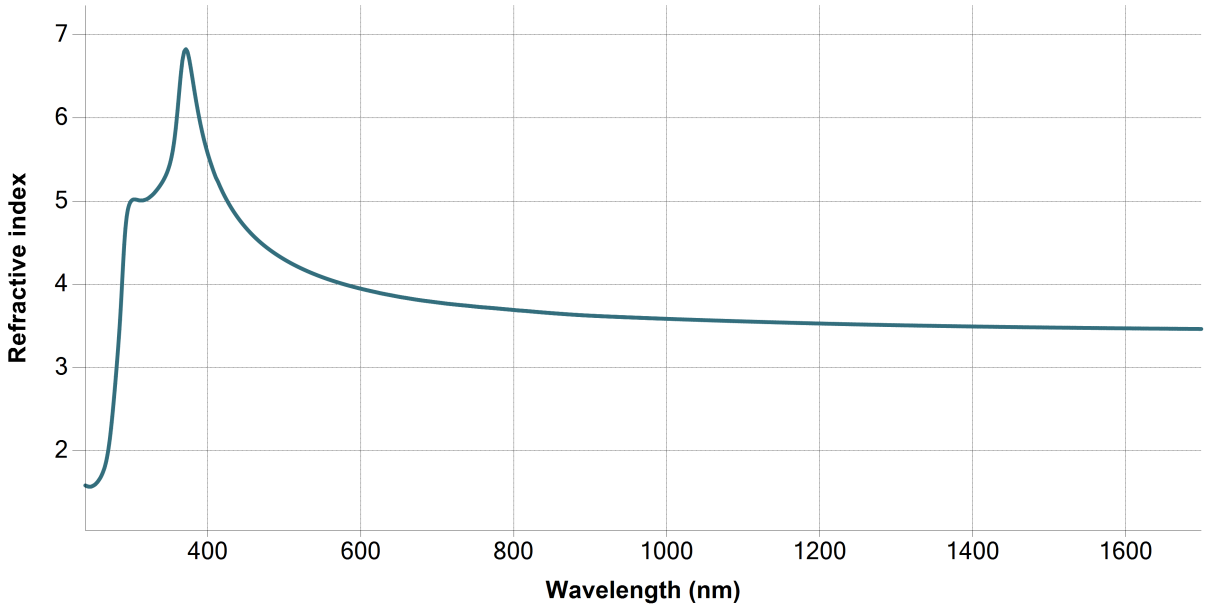


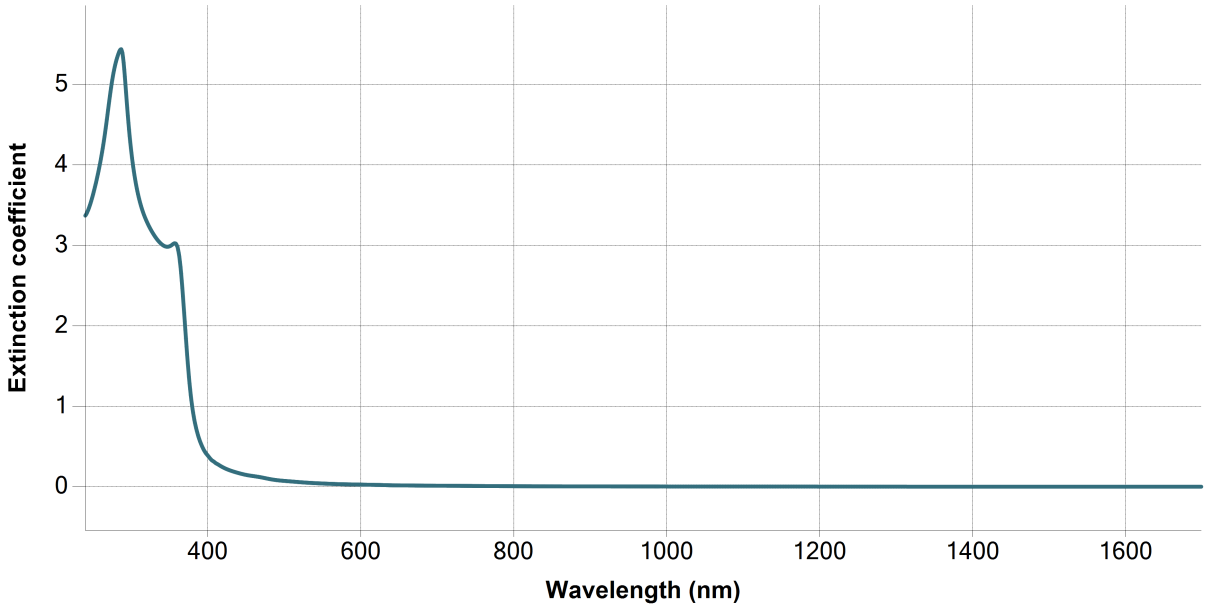
Phase 1 (Bulovic-ITO_tld) - Dispersion graphs





Substrate (si) - Dispersion graphs





Correlation coefficients	
Ph2 - InSn-Nanoparticles - Thickness --- Ph2 - Lorentz[1] - f	-0.1485
Ph2 - InSn-Nanoparticles - Thickness --- Ph2 - Lorentz[1] - E0 (eV)	-0.1177
Ph2 - InSn-Nanoparticles - Thickness --- Ph2 - Lorentz[1] - Γ (eV)	-0.1219
Ph2 - InSn-Nanoparticles - Thickness --- Ph2 - Lorentz[2] - f	-0.1235
Ph2 - InSn-Nanoparticles - Thickness --- Ph2 - Lorentz[2] - E0 (eV)	-0.077
Ph2 - InSn-Nanoparticles - Thickness --- Ph2 - Lorentz[2] - Γ (eV)	0.1054
Ph2 - InSn-Nanoparticles - Thickness --- Ph1 - Bulovic-ITO_tld - Thickness	0.6404
Ph2 - InSn-Nanoparticles - Thickness --- Ph1 - Tauc-Lorentz[1] - A (eV)	0.4285
Ph2 - InSn-Nanoparticles - Thickness --- Ph1 - Tauc-Lorentz[1] - E0 (eV)	0.476
Ph2 - InSn-Nanoparticles - Thickness --- Ph1 - Tauc-Lorentz[1] - C (eV)	0.4531
Ph2 - InSn-Nanoparticles - Thickness --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	0.0623
Ph2 - Lorentz[1] - f --- Ph2 - Lorentz[1] - E0 (eV)	0.9064
Ph2 - Lorentz[1] - f --- Ph2 - Lorentz[1] - Γ (eV)	0.8881
Ph2 - Lorentz[1] - f --- Ph2 - Lorentz[2] - f	-0.9443
Ph2 - Lorentz[1] - f --- Ph2 - Lorentz[2] - E0 (eV)	-0.735
Ph2 - Lorentz[1] - f --- Ph2 - Lorentz[2] - Γ (eV)	-0.9756
Ph2 - Lorentz[1] - f --- Ph1 - Bulovic-ITO_tld - Thickness	0.0318
Ph2 - Lorentz[1] - f --- Ph1 - Tauc-Lorentz[1] - A (eV)	0.044
Ph2 - Lorentz[1] - f --- Ph1 - Tauc-Lorentz[1] - E0 (eV)	0.0593
Ph2 - Lorentz[1] - f --- Ph1 - Tauc-Lorentz[1] - C (eV)	0.0412
Ph2 - Lorentz[1] - f --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	0.1424
Ph2 - Lorentz[1] - E0 (eV) --- Ph2 - Lorentz[1] - Γ (eV)	0.896
Ph2 - Lorentz[1] - E0 (eV) --- Ph2 - Lorentz[2] - f	-0.8523
Ph2 - Lorentz[1] - E0 (eV) --- Ph2 - Lorentz[2] - E0 (eV)	-0.5828
Ph2 - Lorentz[1] - E0 (eV) --- Ph2 - Lorentz[2] - Γ (eV)	-0.8538
Ph2 - Lorentz[1] - E0 (eV) --- Ph1 - Bulovic-ITO_tld - Thickness	0.0811
Ph2 - Lorentz[1] - E0 (eV) --- Ph1 - Tauc-Lorentz[1] - A (eV)	-0.0614
Ph2 - Lorentz[1] - E0 (eV) --- Ph1 - Tauc-Lorentz[1] - E0 (eV)	-0.06
Ph2 - Lorentz[1] - E0 (eV) --- Ph1 - Tauc-Lorentz[1] - C (eV)	-0.07
Ph2 - Lorentz[1] - E0 (eV) --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	0.1251
Ph2 - Lorentz[1] - Γ (eV) --- Ph2 - Lorentz[2] - f	-0.7987
Ph2 - Lorentz[1] - Γ (eV) --- Ph2 - Lorentz[2] - E0 (eV)	-0.5487
Ph2 - Lorentz[1] - Γ (eV) --- Ph2 - Lorentz[2] - Γ (eV)	-0.8493
Ph2 - Lorentz[1] - Γ (eV) --- Ph1 - Bulovic-ITO_tld - Thickness	0.0356
Ph2 - Lorentz[1] - Γ (eV) --- Ph1 - Tauc-Lorentz[1] - A (eV)	0.0913
Ph2 - Lorentz[1] - Γ (eV) --- Ph1 - Tauc-Lorentz[1] - E0 (eV)	0.087
Ph2 - Lorentz[1] - Γ (eV) --- Ph1 - Tauc-Lorentz[1] - C (eV)	0.0771
Ph2 - Lorentz[1] - Γ (eV) --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	0.3296
Ph2 - Lorentz[2] - f --- Ph2 - Lorentz[2] - E0 (eV)	0.8281
Ph2 - Lorentz[2] - f --- Ph2 - Lorentz[2] - Γ (eV)	0.9473

Ph2 - Lorentz[2] - f --- Ph1 - Bulovic-ITO_tld - Thickness	-0.2917
Ph2 - Lorentz[2] - f --- Ph1 - Tauc-Lorentz[1] - A (eV)	-0.1368
Ph2 - Lorentz[2] - f --- Ph1 - Tauc-Lorentz[1] - E0 (eV)	-0.1747
Ph2 - Lorentz[2] - f --- Ph1 - Tauc-Lorentz[1] - C (eV)	-0.1451
Ph2 - Lorentz[2] - f --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	-0.0833
Ph2 - Lorentz[2] - E0 (eV) --- Ph2 - Lorentz[2] - Γ (eV)	0.7844
Ph2 - Lorentz[2] - E0 (eV) --- Ph1 - Bulovic-ITO_tld - Thickness	-0.289
Ph2 - Lorentz[2] - E0 (eV) --- Ph1 - Tauc-Lorentz[1] - A (eV)	-0.1417
Ph2 - Lorentz[2] - E0 (eV) --- Ph1 - Tauc-Lorentz[1] - E0 (eV)	-0.1934
Ph2 - Lorentz[2] - E0 (eV) --- Ph1 - Tauc-Lorentz[1] - C (eV)	-0.1584
Ph2 - Lorentz[2] - E0 (eV) --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	0.0309
Ph2 - Lorentz[2] - Γ (eV) --- Ph1 - Bulovic-ITO_tld - Thickness	-0.0706
Ph2 - Lorentz[2] - Γ (eV) --- Ph1 - Tauc-Lorentz[1] - A (eV)	-0.0384
Ph2 - Lorentz[2] - Γ (eV) --- Ph1 - Tauc-Lorentz[1] - E0 (eV)	-0.0619
Ph2 - Lorentz[2] - Γ (eV) --- Ph1 - Tauc-Lorentz[1] - C (eV)	-0.0407
Ph2 - Lorentz[2] - Γ (eV) --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	-0.072
Ph1 - Bulovic-ITO_tld - Thickness --- Ph1 - Tauc-Lorentz[1] - A (eV)	0.3119
Ph1 - Bulovic-ITO_tld - Thickness --- Ph1 - Tauc-Lorentz[1] - E0 (eV)	0.3847
Ph1 - Bulovic-ITO_tld - Thickness --- Ph1 - Tauc-Lorentz[1] - C (eV)	0.3452
Ph1 - Bulovic-ITO_tld - Thickness --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	-0.0395
Ph1 - Tauc-Lorentz[1] - A (eV) --- Ph1 - Tauc-Lorentz[1] - E0 (eV)	0.9874
Ph1 - Tauc-Lorentz[1] - A (eV) --- Ph1 - Tauc-Lorentz[1] - C (eV)	0.9977
Ph1 - Tauc-Lorentz[1] - A (eV) --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	0.7044
Ph1 - Tauc-Lorentz[1] - E0 (eV) --- Ph1 - Tauc-Lorentz[1] - C (eV)	0.995
Ph1 - Tauc-Lorentz[1] - E0 (eV) --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	0.6068
Ph1 - Tauc-Lorentz[1] - C (eV) --- Ph1 - Tauc-Lorentz[1] - Eg (eV)	0.6584