

Organic Display

OLED AND OTFT ORGANIC DISPLAY SIMULATOR

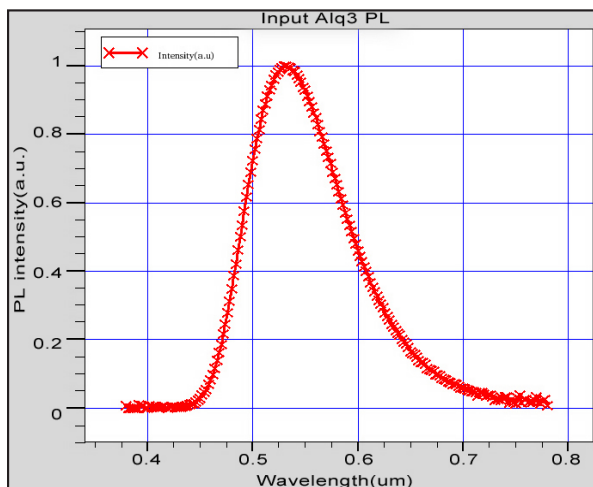
The Organic Display module enables ATLAS to simulate the electrical and optical properties of organic display devices such as OTFTs and OLEDs. Organic Display is integrated into the ATLAS framework and allows the steady-state and transient simulation of the electrical and optical behavior of active organic devices including the singlet and triplet exciton densities, dopant exciton density and optical emission characteristics.

Features

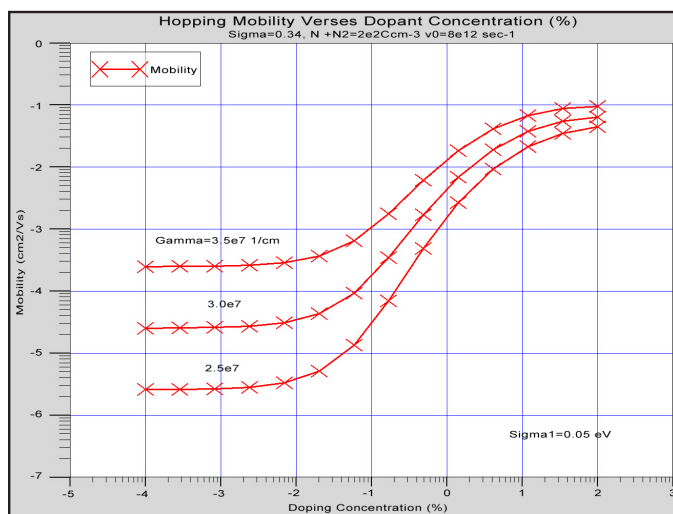
- Organic defect Density Of States (DOS) models
- Poole-Frenkel and hopping mobility models
- Langevin recombination model
- Coupled singlet and triplet exciton density continuity equations
- Exciton generation, diffusion, lifetime and quenching effects
- Doping specific exciton density calculation
- User definable exciton parameters
- Dipole emission model
- User definable singlet-to-triplet exciton generation rate
- Forster mechanism for dopant dipole-dipole energy transfer
- Steady state and transient analysis
- State-of-the-art reverse ray tracing model to give electro-luminescence spectral emission characteristics
- CIE x-y Chart

EL Spectrum

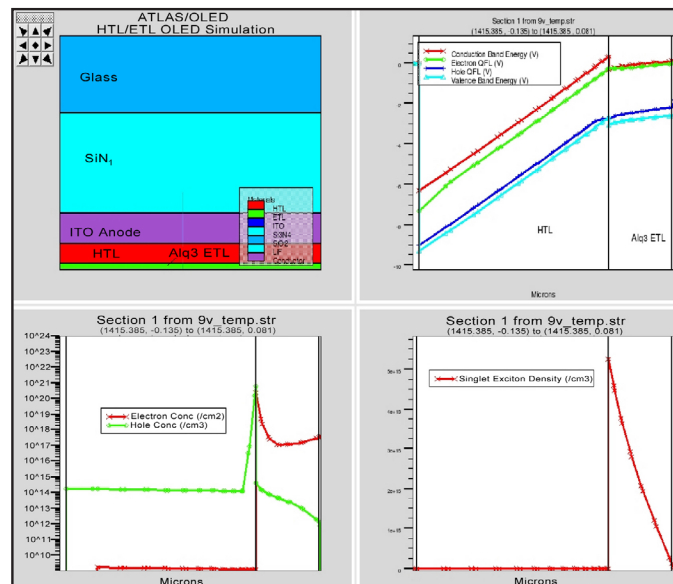
The Electro-Luminescent (EL) spectrum is calculated from the input Photo-Luminescent (PL) spectrum and the output coupling. The output coupling is calculated using the dipole radiation method and ray-tracing in the multiple cavity stacks using wavelength dependent refractive indexes.



Emissive layer Alq3 input PL spectrum.

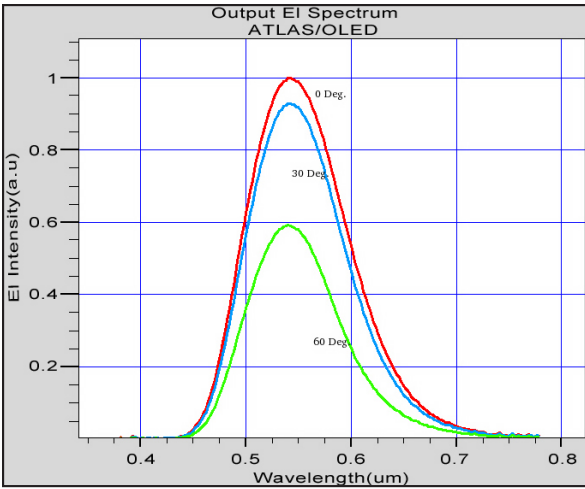


Hopping mobility as a function of Dopant Concentration for an OTFT device.

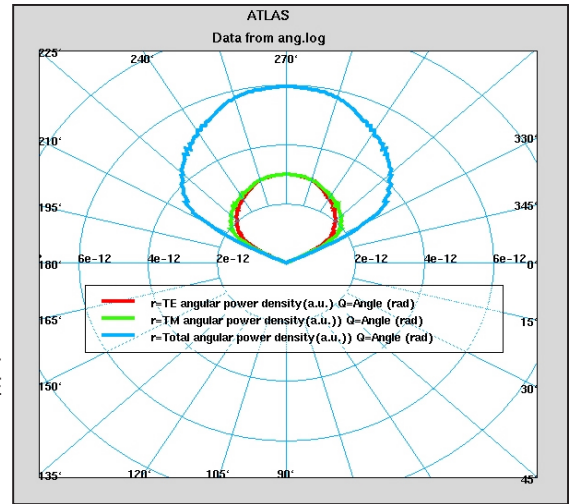


OLED structure made by ATLAS. The band structure, electron/hole concentration and radiative exciton profiles for the Hole Transport Layer (HTL) and the Electron Transport Layer (ETL) regions are shown.

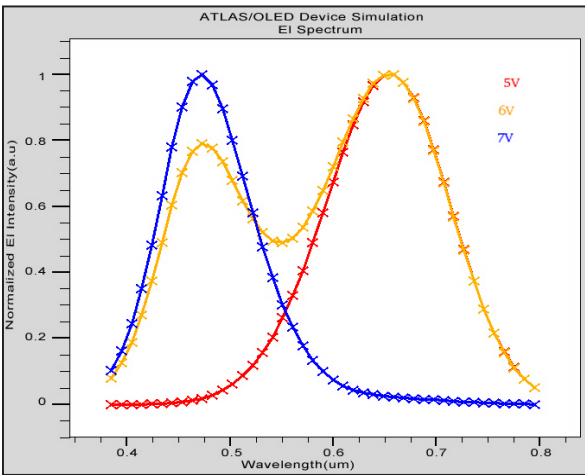
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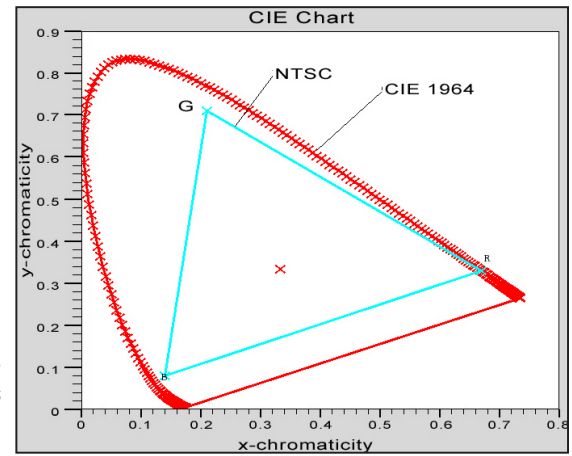
EL emission spectrum.



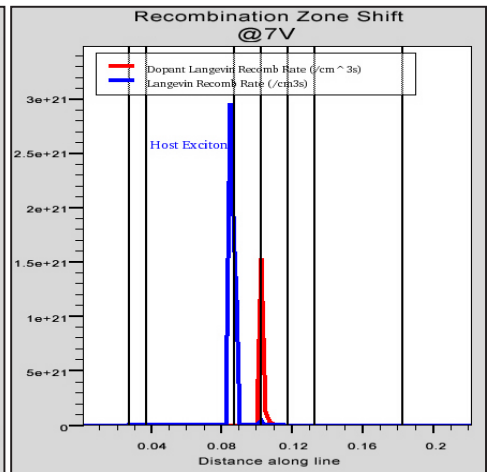
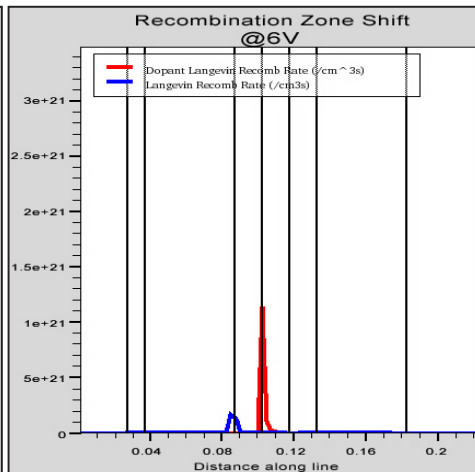
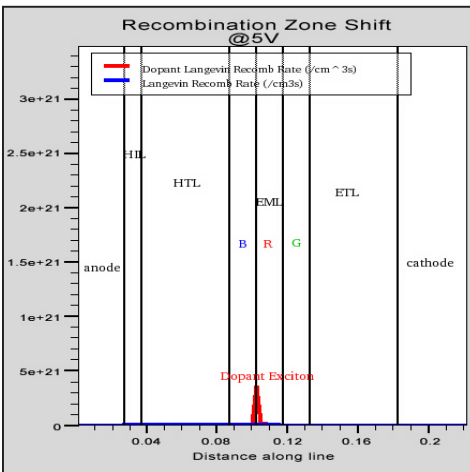
Output angular power density for the TE and TM modes.



Recombination zone shift and the EL spectrum emission shift due to current injection.



CIE x-y chart showing the color points in the CIE diagram.



Host and Dopant Langevin Recombination Rates.

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