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Πρόγραμμα Μεταπτυχιακών Σπουδών

Master of Science By Research in

Ηλεκτρικές & Ηλεκτρονικές Επιστήμες μέσω Έρευνας

Electrical & Electronics Engineering

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STUDENT EVALUATION OF COURSE MODULE

Course title:

Multilayer structures in organic optoelectronic devices

Author (s)

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Sample student evaluation material:

1. Mini project:

Short circuit photocurrent calculation for an OPV structure.

Groups of 2-3 students will analyse the structure of an OPV for its external quantum efficiency and thus its respective short circuit photocurrent. The materials of the OPV's multilayer structure will be followed by the respective spectral refractive indices and extinction coefficients.

Through this project, students will have the opportunity to develop a simple software code based on an OPV's structure modelling method.

2. Theoretical assessment

- How can the emission point influence the outcoupling efficiency of an OLED multilayer device?
- What is the major problem of using an ITO layer regarding the outcoupling efficiency of an OLED device?
- Why should we take into account the spectral refractive index and extinction coefficient of the multilayer materials for the OLED devices?
- Why should we take into account the spectral refractive index and extinction coefficient of the multilayer materials for the OPV devices?
- What is the main advantage of the bulk heterojunction over the single heterojunction OPV device?
- In order to design an OPV multilayer device, what is the major criterion, regarding the field distribution across the layers?

3. Exercise sample

Given the multilayer structure of an OPV, give the equivalent transfer matrix and transmission line model for a specific wavelength of operation. Consider that the thicknesses and the spectral refractive index and extinction coefficients are also given.