OP-B-210

Tuesday, May 10, 2011, 06:00-06:20 pm
Room: Reda 2

MODELLING OF THE RADIATIVE PROPERTIES OF MORPHO RHETENOR: A NUMERICAL INVESTIGATION

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Structural colours in the animal world present optical properties optimized by evolution. They are due to microstructures made out of low-index dielectric material and quite disordered. Thus these structures are a very good source of inspiration for optical engineering. Here, a finite-element method was used to characterize the optical properties of the scales of the iridescent butterfly species Morpho rhetenor. We
considered the photonic structure as a three-dimensional (3D) object, infinite in one direction, made out of a slightly lossy dielectric material. To achieve high accuracy and validity of our approach, the application utilizes various features including Perfectly Matched Layers, periodic boundary condition for computing scattered-field intensities. Our results are twofold: first, we could find again results obtained by Rigorous
Coupled Wave Analysis (RCWA); second, we built a model more close to reality to reproduce the results of optical measurements.