PERFORMANCE OF RCWA AND A FE METHOD IN SIMULATIONS OF PHOTOVOLTAIC DEVICES

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ABSTRACT. Design of photovoltaic devices requires a rapid and reliable way to simulate the optical characteristics for wide ranges of wavelength and angle of incidence. In this work we compare the performance of two numerical methods: the rigorous coupled-wave approach (RCWA) and the finite element method (FEM), the former being fast and flexible, but the latter having predictable convergence even for discontinuous constitutive properties. In order to test both methods, we consider a a real application where the device presents a periodically corrugated metallic backreflector which enhances the electromagnetic field due to the excitation of multiple surface plasmon polariton waves.

References

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