Light management in ultrathin photovoltaics

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Summary

Thin film silicon solar cells have drawn remarkable scientific and industrial interest in recent years. Specifically, light trapping in those cells is entangled with concepts such as excitation of guided waves and plasmonic modes which promise to enhance the efficiency of the cells. As it comes to managing optical waves at nanoscale, the optical modelling is of paramount interest and accessibility to rigorous numerical methods which can solve Maxwell equations within the multilayered texture is an essential; however, clever approximations such as coupled mode theory can reduce the computational load significantly. We present our recent advances in optical modelling of thin film photovoltaics and we discuss approaches to enhance the photocurrent.