

Guided Modes in Planar Dye-sensitized Solar Cells: Minimizing Loss in Potential

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Dye-sensitized solar cells (DSSCs) differ from other photovoltaics in that they rely on a large area nanoparticle network to achieve sufficient absorption of visible light. Although highly successful to date, this approach limits the opportunities to reduce the potential loss inherent in conventional DSSC design. I will describe a resonantly coupled cavity scheme that demonstrates precise multilayer DSSCs with a 30-fold increase in monochromatic incident photon to current efficiency compared to the planar control. On resonance we observe record open-circuit voltages that approach the theoretical limit set by the traditional Ru-dye and iodide-based electrolyte.

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