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Device analysis of vertically aligned single-core nanocoaxial solar cells T. KIRKPATRICK, C. ANDRONACHE, M.J. BURNS, M.J. NAUGHTON, Boston College — Analytical expressions for device transport are derived and numerically calculated for an array of vertically aligned single-core nanocoaxial solar cells. Total current of the device is derived as a function of the geometrical configuration of the photovoltaic junction, and expressions for rectifying current behavior are subsequently solved for and analyzed. Fundamental differences and similarities in the physics of device performance are inferred based on the analytical expressions for planar, nanowire, and nanocoaxial solar cells. To emphasize the physical difference of device performance pertaining to geometrical configuration, a comparison between planar and nanocoaxial device performance is analyzed for an amorphous silicon p-i-n junction solar cell.

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