

## **Modeling and Simulation of InAs/GaAs and GaSb/GaAs Quantum Dot Solar Cells in SILVACO TCAD**

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**Abstract :** In this work, we use Silvaco TCAD software for modeling and simulations of standard GaAs solar cell, InAs/GaAs and GaSb/GaAs p-i-n quantum dot solar cell. When comparing 20-layer InAs/GaAs, GaSb/GaAs quantum dots solar cells with standard GaAs solar cell, the conversion efficiency in simulation results increased from 16.48 % to 22.6% and 16.48% to 22.42% respectively. Also, the absorption range edge of photons with low energies extended from 900 nm to 1200 nm.

**Keywords :** SILVACO TCAD, the quantum dot, simulation, materials engineering

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