Highlights

A test of meta–heuristic algorithms for parameter extraction of next-generation solar cells with S-shaped current-voltage curves

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- 14 meta–heuristic algorithms are used to parameter estimation from S-shaped *IV* curves

- The algorithms' efficiencies are compared by using nonparametric statistic methods

- The relevance of using the square error fitness function has been demonstrated

- STLBO and ADELI excel in identifying parameters of the opposed two-diode model