

## عنوان مقاله:

A Novel Structure of Hydrogenated Amorphous Si (a-Si:H) Solar Cells with Nano-photonic Light-trapping Structures

## محل انتشار:

کنفرانس بین المللی دانشجویان و مهندسان برق، و انرژی های پاک (سال: 1401)

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## خلاصه مقاله:

It is critical to account for trade-offs between optical and electrical performance in the optimization of light-trapping structures for solar cells. This prevents the unconstrained optimization of the optical properties of a device from yielding impractical geometries that suffer severe material quality degradation. In addition to providing a detailed picture of the microscopic device physics affecting carrier collection, our results highlight the importance of accounting for the specific geometry of the defects themselves along with the full optical absorption profile within the device. In this paper, we describe a simulation-based method for simultaneously optimizing the optical and electrical properties of thin-film solar cells with nanophotonic light-trapping structures. A key challenge in the optimization of light-trapping structures is to account for the interdependent optical and electrical properties of solar cells, including variations in material quality. Furthermore, the results demonstrate how optical design can be used to directly benefit the electrical performance of the device.

## کلمات کلیدی:

.Hydrogenated Amorphous Si (a-Si:H), Solar cells, Nano-photonic light-trapping

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1584968>

