

Publication

A Study on Applications of Holography in Solar Energy Installations

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In this paper, applications of holography in the solar energy, photovoltaic concentration, daylighting, illumination, and thermal blocking have been investigated. Holographic elements can be used to concentrate the radiation of the sun onto photovoltaic cells. Moreover the sun radiation is diffracted by the hologram. This has the advantage that proper photovoltaic cells can be installed in different spectral regions. Holographic daylighting systems can diffract sunlight efficiently up to the ceiling in the room. Holograms can be fabricated to reflect or block certain wavelength regions. Holograms are designed for a wavelength in the infrared region and a typical incidence angle of the summer sunlight. In this case the infrared radiation is reflected in the summer and heating of the rooms can be reduced, also, energy for cooling by air conditioners can be reduced. In winter, that the angle of incidence is smaller, a larger wavelength region is reflected, where the infrared intensity is very low.

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