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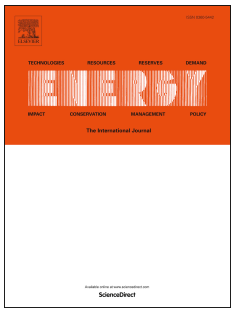

Cumulative and momentary skin exposures to solar radiation in central receiver solar systems

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Cumulative and momentary skin exposures to solar radiation in Central receiver solar systems

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Abstract: On account of the scarcity of fossil fuels and the environmental problems arising from its use and exploitation, countries are opting for developing technologies based on renewable sources as alternatives to achieve the growing energy demand. Among the renewable energy technologies, solar energy seems to be an attractive solution. Usually solar power plants are located in sunny environments due to requirements for power generation. Meanwhile, as the ozone layer damage has been exceeding its natural restoration, a growing level of UV radiation reaches the surface of the earth where the solar industry working public will be facing new risks; among them skin risks. The present paper, focusing on the proper usage of the renewable source, aims to assess skin exposures to solar radiation within solar industry. The assessment was based on direct solar radiation measurements carried out in an experimental solar facility in Mexico. The maximum time to stay unprotected without receiving a noticeable impact on skin is calculated and security measures for solar industry workers are suggested. This research may be seen as a basic evidence of an area within solar industry with improvement opportunities and assist the development of security procedures applicable to solar energy plants' working environments.

Keywords: solar energy; central receiver systems; skin risk assessment.

1. Introduction

The sun is our primary energy source [1]. Energy is an important component in the improvement of life quality and economic development of a country [2]. There are concerns about achieving those goals by using technologies based on fossil fuels. In particular, the environmental matter is the release of considerable amounts of pollutants into the atmosphere [3], called greenhouse gas (GHG) emissions. Among the GHG, the strong increase in carbon dioxide (CO_2) is mainly contributing to the

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