VDB Solar Solutions

Concentrator photovoltaics luque

Overview

What is concentrating photovoltaic technology?

Provided by the Springer Nature SharedIt content-sharing initiative Concentrating photovoltaic (CPV) systems, which use optical elements to focus light onto small-area solar cells, have the potential to minimize the costs, while improving efficiency, of photovoltaic technology.

What is concentrating photovoltaic (CPV)?

Concentrating photovoltaic (CPV) systems, which use optical elements to focus light onto small-area solar cells, have the potential to minimize the costs, while improving efficiency, of photovoltaic technology. However, CPV is limited by the need to track the apparent motion of the Sun.

What is a luminescent solar concentrator?

Luminescent solar concentrators (LSCs), by contrast, exploit different optical mechanisms, with the potential to avoid these limitations 7, 8, 9. A simple LSC consists of a planar, multimode slab waveguide doped with a luminescent species.

Can concentrating photovoltaics track the Sun's motion?

Tracking the Sun's motion in concentrating photovoltaics by rotating the whole system is impractical and hinders commercial deployment. Instead, integrated-tracking approaches, which are discussed in this Review, are more suitable for low-cost, rooftop applications.

How efficient are GaAs concentrator solar cells?

MacMillan, H. et al. 28% efficient GaAs concentrator solar cells. In Conference Record of the Twentieth IEEE 462–468 (IEEE, 1988). James, L. & Moon, R. GaAs concentrator solar cell. Appl. Phys. Lett. 26, 467–470 (1975). Yamaguchi, M. III–V compound multi-junction solar cells: present and future. Sol. Energy Mater. Sol. Cells 75, 261–269 (2003).

How does a solar concentrator work?

Conventional concentrators use focusing lenses and mechanical devices (that is, trackers) to maintain alignment with incident solar radiation 4, 5. This design can be attractive, particularly, when implemented with high efficiency compound semiconductor PV cells.

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High Concentrator PhotoVoltaics efficiencies: Present status and

High Concentrator PhotoVoltaics technology is still in a deployment stage, but the cells and modules efficiency data offered by their manufacturing companies, as well as the measuring experiments carried out by several research centers, forecast an attractive

III-V Multi-junction solar cells and concentrating photovoltaic (CPV

It has been proven that the only realistic path to practical ultra-high efficiency solar cells is the monolithic multi-junction approach, i.e., to stack pn-junctions made of different semiconductor materials on top of each other. Each sub pn-junction, i.e., sub solar cell, converts a specific part of the sun's spectrum. In this way, the energy of the sunlight photons is converted ...

Wind Load Analysis of A Solar Tracker For Concentrator Photovoltaics

Concentrator photovoltaics, Wind load analysis, Computational fluid dynamics PACS: 88.40.hj, 47.11.-j INTRODUCTION The rapid growth of photovoltaics (PV) in recent years have prompt various types

Investigation of Concentrator Photovoltaic Modules with Cascade ...

Abstract The measuring capabilities of a solar radiation simulator and computer simulation have been used in the study of concentrator

photovoltaic modules with three-junction solar cells based on the GaInP/GaInAs/Ge structure. The possibility of using two methods together is shown to explain the processes occurring during the conversion of radiation in the ...

Concentrated PhotoVoltaics (CPV): Is it a real opportunity?

[10] Luque A., Sala G., Mi ~ nano J. C. and Ben ´ itez P., Sol. Ener. Mater. Sol. Cells, 51 (1998) 269. [11] Luque-Heredia I One of these new technologies is concentrator photovoltaics (CPV

Some Results of the EUCLIDES Photovoltaic Concentrator ...

A. Luque Instituto de Energía Solar, Universidad Politécnica de Madrid, Ciudad Universitaria, 28040 Madrid, Spain A photovoltaic concentration array prototype of 60·4 m 2 of aperture is described. It uses reflecting linear optics kept in focus by means of All its

High efficiency and high concentration in photovoltaics

Their use in terrestrial applications will likely be for concentrators operating at very high concentrations. (Yamaguchi and Luque, 1999). In 1997, a four-layered GaInP/GaAs/(not specified

[Inspira's CPV Sun Tracking]

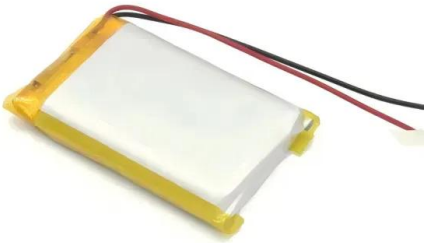
Most PV concentrators use only direct solar radiation, and they must therefore permanently track the sun's apparent daytime motion, and hence integrate an automatic sun tracking structure ...

The Sun Tracker in Concentrator Photovoltaics , SpringerLink

This chapter provides an updated insight into the specifications and design issues associated with the sun tracker in photovoltaic concentrators, regarding both the mechanical ...

Tracking-integrated systems for concentrating photovoltaics

Concentrating photovoltaic (CPV) systems, which use optical elements to focus light onto small-area solar cells, have the potential to minimize the costs, while improving ...



?Ignacio Luque-Heredia?

The sun tracker in concentrator photovoltaics I Luque-Heredia, G Quéméré, R Cervantes, O Laurent, E Chiappori, Next Generation of Photovoltaics: New Concepts, 61-93, 2012

The EUCLIDES Concentrator

EUCLIDES is a reflective parabolic trough concentrator (PTC) that consists of a linear array tracking around a horizontal N/S axis. The system was conceived in the mid-1990s, sustained on two fundamental pillars. Firstly, the background and wide-ranging

Multijunction Concentrator Solar Cells: An Enabler for Low-Cost

TY - CHAP T1 - Multijunction Concentrator Solar Cells: An Enabler for Low-Cost Photovoltaic Systems AU - NREL, null PY - 2007 Y1 - 2007 M3 - Chapter SP - Chapter 10, 199-219 BT - Concentrator Photovoltaics A2 - Luque, A. L. A2 - Andreev, V. M. ER

An Overview of Concentrated Photovoltaic Technology

The strong point of concentrated photovoltaics is the increase in the efficiency of solar cells. In fact, Shockley and Queisser defined, in their article published in 1960 and entitled "Detailed Balance Limit of Efficiency of p-n Junction Solar Cells" [], a maximum conversion efficiency of about 30% for single-junction solar cells under an illumination of 1000 W/m 2.

Solar Cells and Optics for Photovoltaic Concentration

Solar cells and concentrators variable injection analysis of solar cells series resistance and bidimentional effects in concentrating cells back point contact silicon solar cells very high concentration limits of silicon solar cells compound semiconductor solar cells cooling of solar cells the solar radiation non imaging optics and static concentration synthesis of static

concentrators ...

Concentrator Photovoltaics , Request PDF

A. Luque. The general idea of a photovoltaic (PV) concentrator is to use optics to focus sunlight on a small receiving solar cell (Fig. 1.1); thus, the cell area in the focus of the

The Sun Tracker in Concentrator Photovoltaics , SpringerLink

This chapter provides an updated insight into the specifications and design issues associated with the sun tracker in photovoltaic concentrators, regarding both the mechanical structure and the electronic control unit, along with the description of a set of

Antonio Luque

Antonio Luque López (born Málaga, 15 August 1941) is a Spanish scientist and entrepreneur in the field of photovoltaic solar energy 1979 he founded the Institute of Solar Energy of the Technical University of Madrid (IES-UPM) and was its director till his retirement in 2017; he is currently its honorary president as well as professor emeritus in this university.

CPV Modules

However, it discusses only Fresnel-based concentrator photovoltaics (CPV) modules according to the IEC 62108, and therefore excludes all CPV architectures other than micro-concentrator. The chapter describes the various trade-offs ...

[Concentrating Photovoltaics]

Concentrating Photovoltaics (CPV) is a technology that associates a concentrator with a photovoltaic device as shown in the Fig. 4.1. In a more detailed way, the concentrator is actually one or a series of optical devices that concentrate the sun beams onto a solar cell in order to increase the electrical output of the photovoltaic device by increasing the ...

Very-High-Concentration Challenges of III-V Multijunction Solar ...

Concentrator Photovoltaics Chapter Very-High-Concentration Challenges of III-V Multijunction Solar Cells Chapter pp 89 Very-High-Concentration Challenges of III-V Multijunction Solar Cells. In: Luque, A., Viacheslav, A. (eds) Concentrator, Heidelberg. https :

'Concentrator Photovoltaics' von 'Antonio L. Luque'

Concentrator Photovoltaics von Antonio L. Luque, Viacheslav M. Andreev Geschäftskunden Kundenprogramme Orell Füssli Startseite Titel, Autor*in, Stichwort, ISBN Suche-Formular zurücksetzen Suchanfrage abschicken

Design and Construction of Prototype Mobile Sun-Tracking ...

This paper proposes a mobile sun-tracking system, which allows continuous tracking of the sun and effective harvesting of solar energy on mobile platforms. Based on the dynamic sun-tracking algorithm which we previously proposed, the system takes not only the

High-Concentrator Photovoltaic Systems Configuration and Inverters

IEC 62108 (2007) Concentrator photovoltaic (CPV) modules and assemblies--design qualification and type approval Google Scholar Bett A, Dimroth F, Siefer G (2007) Multijunction concentrator solar cells. In: Luque A, Andreev V (eds) Concentrator

High-Efficiency Photovoltaic Modules with Solar Concentrators

Abstract The results of research and development of solar concentrator photovoltaic modules with an area of 0.5 m2 based on Fresnel lenses with secondary solar concentrators in the form of inverted pyramids and multi-junction solar cells at the focus of Fresnel lenses are presented. The developed concentrator photovoltaic modules provide a high ...

Concentrator Optics for Photovoltaic Systems

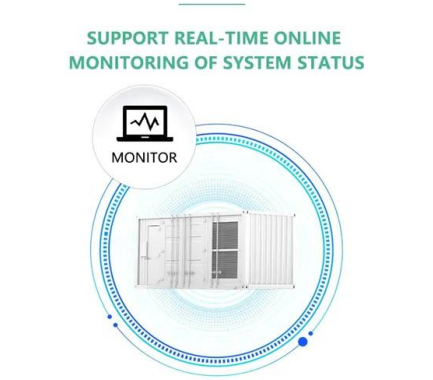
An overview of the fundamentals, the optimization strategies, and specific optical designs of concentrators for concentrated photovoltaic (CPV) systems is given. Several designs of secondary optical element (SOE) were compared with respect to their CAP and the achievable photocurrent densities.

Concentrator Optics

Concentrator Photovoltaics Chapter Concentrator Optics Chapter pp 113-132 Cite this chapter Download book PDF Luque, A., Viacheslav, A. (eds) Concentrator Photovoltaics. Springer Series in Optical Sciences, vol 130. Springer, Berlin, Heidelberg. https :

Ignacio LUQUE-HEREDIA , CEO , PhD , Research profile

Ignacio LUQUE-HEREDIA, CEO , Cited by 382 , , Read 24 publications , Contact Ignacio LUQUE-HEREDIA Home Ignacio The prediction of the energy yield of HCPV (high concentrator photovoltaic



Flexible concentrator photovoltaics based on microscale silicon ...

Here we show a type of composite luminescent concentrator PV system that embeds large scale, interconnected arrays of microscale silicon solar cells in thin matrix layers ...

The Sun Tracker in Concentrator Photovoltaics

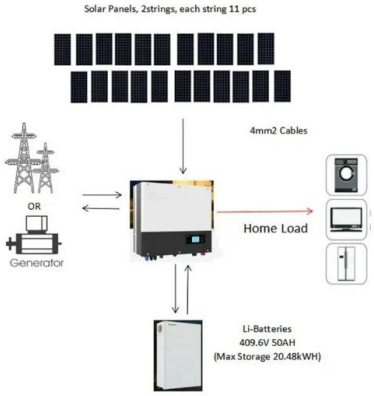
This chapter provides an updated insight into the specifications and design issues associated with the sun tracker in photovoltaic concentrators, regarding both the mechanical structure and the electronic control unit, along with the description of a set of

Concentrator Photovoltaics (Springer Series in Optical Sciences, ...

Specific contributions include: theory and practice of sunlight concentrators; an overview of concentrator PV activities; a description of concentrator solar cells; design and ...

Photovoltaic Concentrators

What is the Aim of Photovoltaic Concentration and What Does it Do? Objectives, Limitations and Opportunities Typical Concentrators: an Attempt at Classification Concentration Optics: Thermodynamic Limits Factors of Merit for Concentrators in Relation to the



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