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明细：

序号	文章信息	入藏号	作者贡献
1	Yang, Shangyi (1);Su, Hongbo (1);Wan, Bo (1);Lu, Heng (1);Wang, Zixuan (1);Yang, Xiaoling (1);Song, Yujie (1). Research on the Scheduling of Heliostat Fields in Tower Solar Power Plants Based on Optical Efficiency Calculation Model. Sustainable Civil Infrastructures. 2025.Part F4042 :37-49	EI:20250317706752	通讯作者
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Accession number:20250317706752

Title:Research on the Scheduling of Heliostat Fields in Tower Solar Power Plants Based on Optical Efficiency Calculation Model

Authors:Yang, Shangyi (1);Su, Hongbo (1);Wan, Bo (1);Lu, Heng (1);Wang, Zixuan (1);Yang, Xiaoling (1);Song, Yujie (1)

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Source title: Sustainable Civil Infrastructures

Abbreviated source title:Sustain. Civil Infrastruct.

Volume: Part F4042

Issue date: 2025

Publication year: 2025

Pages:37-49

Language:English

ISSN: 2366-3405

Document type:Book chapter (CH)

Publisher:Springer Science and Business Media B.V.

Abstract:This paper comprehensively studies the scheduling optimization strategy of heliostat fields in tower solar power plants, analyzes the key characteristics of heliostat technology, and the influencing factors of optical efficiency by constructing an optical efficiency calculation model. Furthermore, the paper proposes a scheduling optimization scheme for heliostat fields based on the optical efficiency model, and verifies the effectiveness of the optimization strategy through simulation and simulation. Through in-depth analysis of practical application cases, the significant effects of optimization measures in improving optical efficiency, increasing power generation and reducing operation and maintenance costs are demonstrated. In addition, cost–benefit analysis reveals that although implementing optimization strategies requires certain initial investment, due to efficiency improvement and cost savings, the investment payback period is significantly shortened, proving the economic feasibility of the strategy. This study provides scientific basis and practical guidance for efficiency optimization and cost control of tower solar power plants. © The Author(s), under exclusive license to Springer Nature Switzerland AG 2025.

Controlled terms:Cost benefit analysis-Heliostats (instruments)-Solar power plants

Uncontrolled terms: ['Calculation models', 'Efficiency calculations', 'Heliostat field', 'Heliostat field scheduling', 'Optical efficiency', 'Optimization strategy', 'Plant analysis', 'Power', 'Scheduling optimization', 'Tower solar power plant']

Classification code: ['702.3 Solar Cells', '911.1 Cost Accounting', '912.2 Management', '941.2 Optical Variables Measurements', '942.1.3 Optical Instruments', '1008.4 Solar Energy Conversion and Power Generation']

DOI:10.1007/978-3-031-72509-8_4