

Accepted Manuscript

Parametric study of the small scale linear Fresnel reflector

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PII: S0960-1481(17)30929-1

DOI: [10.1016/j.renene.2017.09.066](https://doi.org/10.1016/j.renene.2017.09.066)

Reference: RENE 9264

To appear in: *Renewable Energy*

Received Date: 23 January 2017

Revised Date: 20 July 2017

Accepted Date: 20 September 2017

Please cite this article as: Barbón A, Barbón N, Bayón L, Sánchez-Rodríguez JA, Parametric study of the small scale linear Fresnel reflector, *Renewable Energy* (2017), doi: 10.1016/j.renene.2017.09.066.

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Manuscript Number: RENE-D-17-00227R3

Title: Parametric study of the small scale Linear Fresnel Reflector

Article Type: Research Paper

Keywords: Linear Fresnel Reflector; Parametric study; Sensitivity analysis

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Abstract: This paper addresses the influence of the transversal and longitudinal parameters in the performance of a small scale linear Fresnel reflector (SSLFR) without longitudinal movement. The main purpose of this study is to show the influence of the design parameters (receiver height, mirror length, and mirror width) on the energy absorbed by the absorber tube. In addition, the influence of these parameters on the shading of the absorber tube is also analysed. Different configurations are analysed regarding the longitudinal angle that the mirrors and the absorber tube form with the horizontal plane. Each of these configurations is analysed considering the optimal length and longitudinal position of the absorber tube. Numerical simulations show the influence of mirror width, mirror length, and receiver height on the energy absorbed. The simulations allow us to analyze the monthly variation of this influence throughout the year, considering also the effect of the latitude. A sensitivity analysis is also carried out in order to evaluate the importance of the parameters.

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