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DESIGN AND FABRICATION OF A LOW COST PARABOLIC SOLAR DISH CONCENTRATOR

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Abstract

The objective of this project was to design a low cost parabolic solar dish concentrator with small-to moderate size for direct electricity generation. Such model can be installed in rural areas which are not connected to governmental grid. Special attention is given to the selection of the appropriate dimensions of the reflecting surfaces to be cut from the available sheets in the market aiming to reduce both cutting cost and sheets cost. The dimensions of the ribs and rings which support the reflecting surface are optimized in order to minimize the entire weight of the dish while providing the minimum possible total deflection and stresses in the beams. The study recommends to use landscape orientation for the reflective facets and increase the ribs angle and the distance between the connecting rings. The methodology presented is robust and can be extended to larger dish diameters.

Keywords: Parabolic Solar Dish, Electricity generation, Rural areas, Ribs and Rings.

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