DESIGN AND CONSTRUCTION OF A LOW COST OFFSET PARABOLIC SOLAR CONCENTRATOR FOR SOLAR COOKING IN RURAL AREAS

Javier Diz-Bugarin, Dept. Electronics, IES Escolas Proval

Av. Portugal 171, Nigran E36350, Galicia, Spain

javier.diz@edu.xunta.es

INTRODUCTION

In this paper will be presented the process of design and construction of a low cost solar concentrator for cooking in remote areas and underdeveloped countries. To avoid complexity of design of an specific shaped surface a common offset parabolic antenna is used to make the reflector. This type of antennas are widely used both in developed and underdeveloped countries, are cheap and easy to obtain. The parabolic reflector is placed under the pot almost horizontally, specially at midday when the sun reaches elevations of around 65 degrees.

This configuration offers many advantages over most common centered-focus solar cookers, like lower wind resistance and higher stability of the structure because of lower center of gravity. It also produces vertically reflected rays that reach the food pot at the bottom like in conventional stoves. Offset parabolic reflectors are more efficient since objects placed at the focus don't create shadows over the reflecting surface.

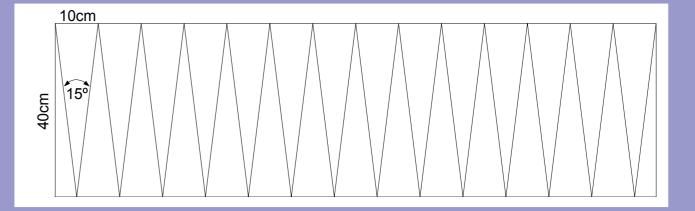
REFLECTOR CONSTRUCTION





Reflective cover: a) aluminium sheet

b) polypropylene film



reflective film cutting diagram

Different types of reflective surfaces have been tested, like aluminium foil and metalized polypropylene sheets.

The paper also describes the prototype construction process and test with a parabolic dish of 80 cm diameter.



TYPES OF PARABOLIC REFLECTORS			
	TYPES	S OF PARABOLIC REFLE	CTORS
			Elevation angle





Cutting and coating

FRAME DESIGN AND ASSEMBLY



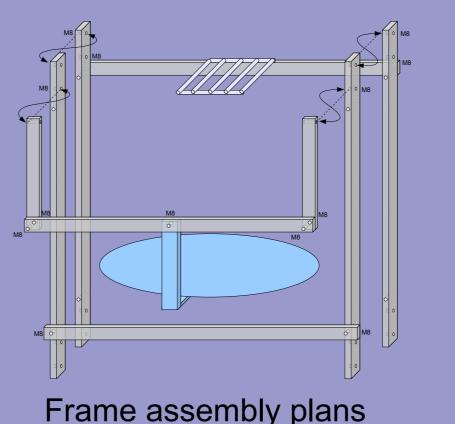




Original parabola

U adapter

Modified parabola support

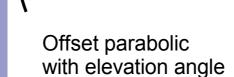


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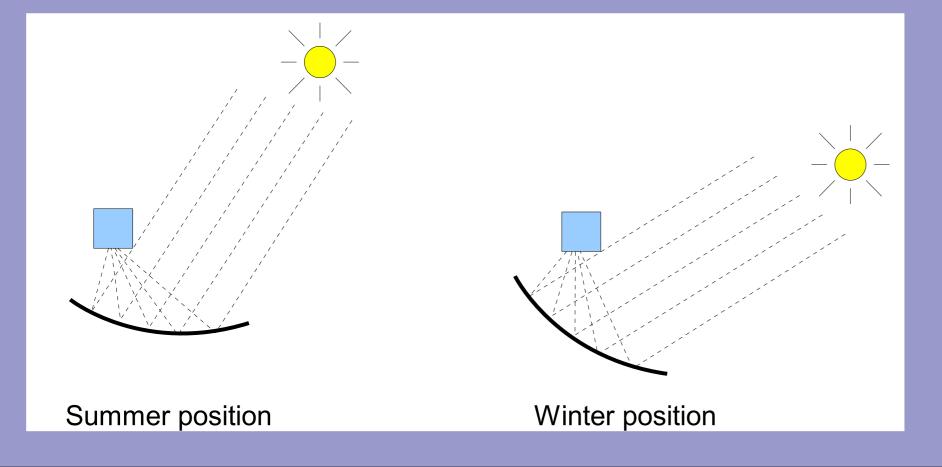
List of parts

/ / /
V
Centered focus parabolic

Ofset parabolic



OFFSET PARABOLIC HORIZONTAL REFLECTOR







Examples of use: baking chestnuts and making coffee





Storage position

Disassembly for transportation