

Experimental Analysis of Parabolic Concentrator Automatic Solar Tracking System

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Abstract— Due to the energetic problems which society has been facing, the development of technologies to increase the efficiency of solar systems is of paramount importance. The solar concentration enables the concentration of solar energy in a focus, which allows a significant increase in energy intensity. The efficiency of solar concentrators can be improved with the addition of a dual axis solar tracker system which allows a significant increase in the amount of stored energy. It includes design and construction of a solar dish concentrator with tracking system at low cost, the optical and thermal modeling of this system and a performance analysis through experimental model and tests. The experimental validation allows concluding that the application of a tracking system to the concentrator is very important since a minimum delay of the solar radiation leads to important losses of system efficiency.

Index Terms— Parabolic concentrator, automatic tracker, solar power meter, tracking system controller, concentration ratio, global radiation