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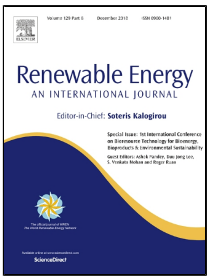

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THERMAL ANALYSIS OF A FINNED RECEIVER FOR A CENTRAL TOWER SOLAR SYSTEM

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Abstract

In this study, a thermal analysis of a finned receiver prototype for a thermosolar tower system is presented. The experimental system consists of parallelepiped aluminum enclosure of 1.2 m high, 1.23 m wide and 0.1 m depth. At the interior, 1232 cylindrical fins with a diameter of 0.0095 m (3/8") and 0.09 m length increases the heat transfer area up to 225%. The vertical wall receives the incoming solar concentrated radiation from a group of heliostats whilst at the interior a constant flow of water removes the absorbed energy. Experimental temperature profiles were obtained at different heights and depths and a comparison was made with numerical results obtained with the use of commercial CFD software. It was found that the maximum thermal efficiency of the receiver was 94.4 %, decreasing as the radiative flux increases.