

Amélioration des performances thermiques d'un capteur solaire plan à air , Etude expérimentale dans la région de Biskra

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Authors: K. Aoues, N. Moummi, M. Zellouf, A. Moummi, A. Labed, E. Achouri et A. Benchabane.

Abstract

This paper presents the results of an experimental investigation of the performance of a flat plate air solar collector outfitted with artificial roughness of different forms and different arrangements. A complete collector test facility equipped with data acquisition system has been assembled and tested for this purpose. A flat plate solar collector, of 1.74 m² area has been designed and constructed. The adapted artificial roughness unit is structured from fin galvanized metal. Four configurations with two forms (model-1 and model-2) of artificial roughness and two arrangements (A and B) are combined (A1, A2, B1 and B2) and tested. The flat plate air solar collector was mounted on a stand facing south at an inclination angle, and they were tested in the environmental conditions. The experimental setup was instrumented for the measurement of solar radiation, ambient temperature, outlet and inlet air temperature, air flow rate and wind velocity.

Keywords: Capteur solaire plan à air - Transfert thermique - Convection forcée - Rugosités artificielles.

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