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Analysis of the Effect of GSR on the Performance of Double Flow Corrugated Absorber Solar Air Heater

Authors : S. P. Sharma, Som Nath Saha

Abstract : This study investigates the effect of Global Solar Radiation (GSR) on the performance of double flow corrugated absorber solar air heater. A mathematical model of a double flow solar air heater, in which air is flowing simultaneously over and under the absorbing plate is presented and solved by developing a computer program in C++ language. The performance evaluation is studied in terms of air temperature rise, energy, effective and exergy efficiencies. The performance of double flow corrugated absorber is compared with double flow flat plate and conventional solar air heaters. It is found that double flow effectively increases the air temperature rise and efficiencies in comparison to a conventional collector. However, corrugated absorber is more superior to that of flat plate double flow solar air heater. The results show that increasing the solar radiation leads to achieve higher air temperature rise and efficiencies.

Keywords : corrugated absorber, double flow, flat plate, solar air heater
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