



## Numerical simulation of solar air heater with V-groove absorber used in HD desalination

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### ABSTRACT

It is based on the heat transfer analysis of double-pass solar air heater with V-groove absorber, and used CFD software to make numerical simulation for the air flow paralleling with the V-groove in the air heater. The comparisons of simulation data with the experimental ones are made, it shows that the average difference between them is less than 8%, and the method of simulation is reliable. It is found by simulation that if the air flows across the V-groove in the air heater, the parameters of air heater, such as outlet air temperature, inlet-outlet pressure drop and efficiency of heat collected would be higher than the ones of parallel-flow under the same conditions; if the included angle of V-groove is increased, the inlet-outlet pressure drop of air in the heater would be decreased appreciably, and the outlet air temperature decreased obviously; if the height of V-groove is reduced about 10%, the inlet-outlet pressure difference of air in the heater would be reduced considerably, but the outlet temperature of it would be reduced seldom.

*Keywords:* V-groove; Parallel-flow; Cross-flow; Solar air heater; Numerical simulation; HD desalination

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