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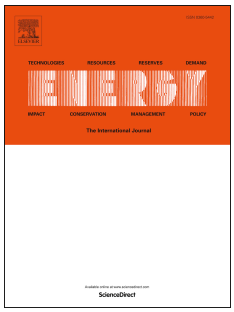

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Thermodynamic Analysis of the Ejector Refrigeration Cycle Using the Artificial Neural Network

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Abstract

This paper describes the results of the ejector refrigeration cycle using R600 as a working fluid. The evaporator, generator and condenser are assumed as heat exchangers that exchange heat with three external fluids. The evaporator heat capacity is fixed at 5kW. Effects of temperature difference in the heat exchangers (ΔT) and generator pressure (P_g) on the coefficient of performance, generator and condenser heat rates, ejector entrainment ratio and the pump work are investigated. Engineering equation solver (EES) software is used for calculating the refrigerant properties. A computer program has been written in MATLAB environment is using neural network toolbox and genetic algorithm. New formulation obtained from ANN for this cycle is presented for calculating the target values. Accuracy of ANN model in terms of the root absolute fraction of variance (R) and the mean squared error (MSE) are evaluated. Also Particle Swarm Optimization (PSO) and Ant Colony Optimization **(**ACOR) are used to find the maximum values of cycle performance.

Key words: Ejector; Entrainment ratio; ANN; COP; Refrigeration cycle; PSO

Nomenclature

A	area (m^2)	$\dot{W}$	work rate (kW)