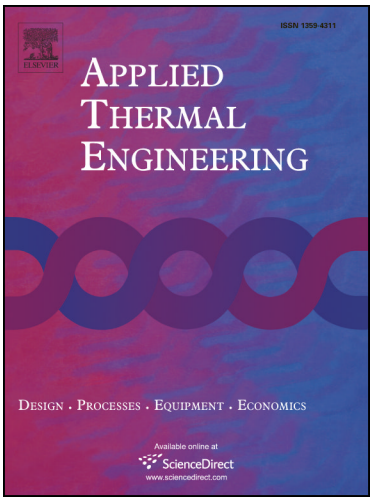

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Employing thermoelectric generator for power generation enhancement in a Kalina cycle driven by low-grade geothermal energy

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Abstract

The Kalina Cycle is believed to be one of the most promising options for power generation from renewable energy and low temperature heat sources such as geothermal energy. It has been given a lot of attention in recent years due to its promising and favorable characteristics. Also, recently employing thermoelectric generators (TEGs) are widely developed to convert heat into electricity directly. The possibility of employing thermoelectric generators to utilize the waste heat of a Kalina cycle is investigated in the present paper. The proposed system performance is modeled, analyzed and compared with the conventional Kalina cycle performance. To assess the systems' performances, thermodynamic and economic models are developed and a parametric study is carried out. The results indicated an enhancement of around 7.3 % for net output power and energy and exergy efficiencies for the proposed system as compared to the conventional Kalina cycle, at a typical operating condition. In addition, an economic evaluation of integrating thermoelectric generators with the Kalina cycle is conducted and the conditions are indicated under which the proposed system is profitable.

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