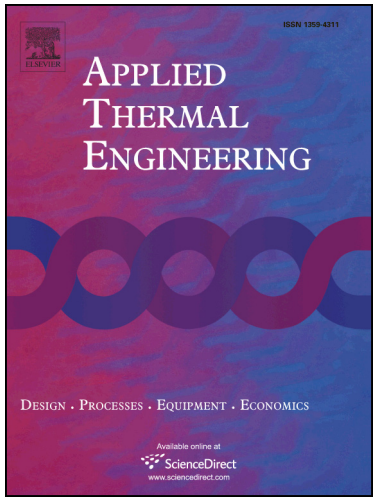


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# Thermal analysis of a heat pipe solar central receiver for concentrated solar power tower

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## Abstract

A novel heat pipe solar central receiver for a molten salt solar power tower is presented. The basic element consists of a reflector, heat pipe, and receiver tube. The reflector redirects concentrated sunlight from the heliostats field onto the evaporator section of the heat pipe. After absorbing the radiative heat energy, the working fluid inside the heat pipe is vaporized at the evaporator section, and flows to the condenser section of the heat pipe where it condenses. The condenser section is inserted into the receiver tube, and is cooled by a cross flow of the heat transfer fluid inside the receiver tube. In the proposed concept, the receiver tube is free from direct irradiation by the sunlight and therefore can be kept warm by electrical heating. This will extend the daily operating time of the receiver and greatly reduce possible freezing of the molten salt. In this study, a cavity receiver with the same geometry and boundary conditions as the Molten Salt Electrical Experiment (MSEE) cavity receiver was developed. Numerical simulation