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CALCULATION SCHEME OF A THERMODYNAMICAL TIME DEPENDENT MODEL OF THE HEAT REGENERATION PROCESS IN A SOLAR STIRLING ENGINE

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Abstract

The aim of this paper is to propose a set of thermal models for the regenerator by taking into account the time dependent heat transfer processes, and to combine them with the thermodynamic lumped description of the solar Stirling engine, accordingly to recent description.

By using analytical and numerical methods, the optimum power of the engine is sought when various constrains (or not) are considered, particularly fixed heat transfer rate available at the source.

A sensitivity analysis of the optimum power of the engine and the corresponding set of thermodynamics state variable with respect to the main model parameters of the machine is performed.

The main conclusion of this work will reconsider the transient behavior of the regenerator heat exchanger for maximum power output and corresponding optimum design of a solar Stirling engine.

Key words: heat regeneration process, time dependence

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