Universität Stuttgart
Institute of Nuclear Technology
and Energy Systems

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Institute of Nuclear Technology and
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Master/ Bachelor Thesis/ Studienarbeit

Design of an air-air recuperator for an open-air recuperated Brayton cycle

Objective:

The objective of this work is to design an air-air recuperator for an open-air recuperated Brayton cycle.

Background:

The open-air Brayton cycle has been already extensively used by aerospace and power industries. Thanks to the previous gained knowledge and the possibility to integrate the cycle with different heat sources, the open-air Brayton cycle is considered as a solution for power conversion unit for a Heat Pipe-Cooled Micro Modular Reactor (HP-MMRs).

In order to provide an efficient energy conversion system, it is important to design the components. This works aims to investigate the design of an air-air recuperator for the open-air Brayton cycle. Different designs, technical solutions and boundary conditions should be considered in order to understand the impact of some key design parameters and find the most suitable solution.

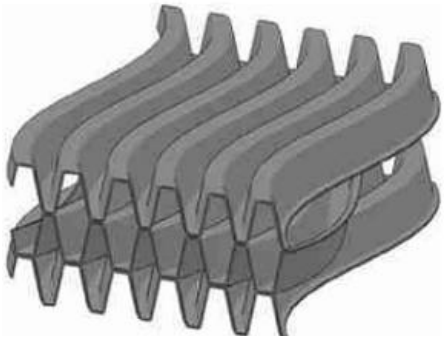

Figure 1: Schematic of a cross-wavy recuperator surface

Approach:

- Literature study on air-air recuperator
- Realization of a model for the calculation of the heat exchanger design (based on previous works)
- Analysis considering different constraints and designs
- Thesis preparation and presentation

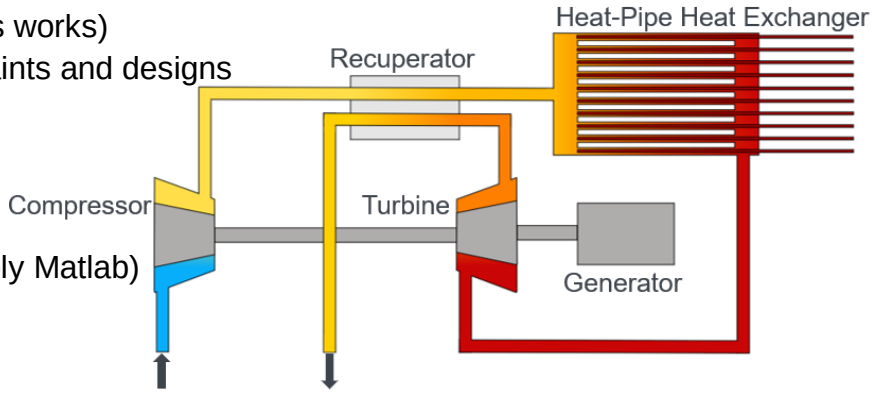

Figure 2: Schematic representation of the open-air recuperated Brayton cycle

Requirements:

- Fundamentals of thermodynamics
- Experience in programming (preferably Matlab)
- Analytical thinking and self-initiative
- English language skills

Start: as soon as possible

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Date 22.10.2024