Universität Stuttgart
Institute of Nuclear Technology
and Energy Systems

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Bachelor or Master Thesis

Investigation of the Supercritical CO_2 Test Facility SCARLETT with AI-methods

Objective:

The objective of this work is to analyse and utilize the measurement data of SCARLETT (**S**upercritical **Ca**rbon Dioxide **L**oop at IK**E** Stu**tt**gart) with the help of AI-methods

Background:

sCO_2 is a promising working medium for various next-generation applications, both in the field of renewable and conventional power generation (project ISOP, SOLARSCO2OL, ShunShot, Misha). Various experimental loops, e.g. SCARLETT, SOFIA, support the sCO_2 research.

Within the scope of this work, the available measurement data of SCARLETT shall be analysed in detail to recognize patterns and improve the understanding of the component and test loop characteristics. With the help of AI-methods, special operation regions are detected and component models are improved and further developed based on existing analyses.

Approach:

- Literature study on AI-methods for measurement data analysis and component modelling
- Familiarization with the existing Matlab and Python code
- Identification of patterns and different operation regions
- Improvement of existing models/performance maps
- Possibly AI-based plant model
- Thesis preparation and presentation

Requirements:

- Fundamentals of thermodynamics and fluid dynamics
- Preferably basic knowledge in AI/Machine Learning
- Analytical thinking and self-initiative

Start: as soon as possible

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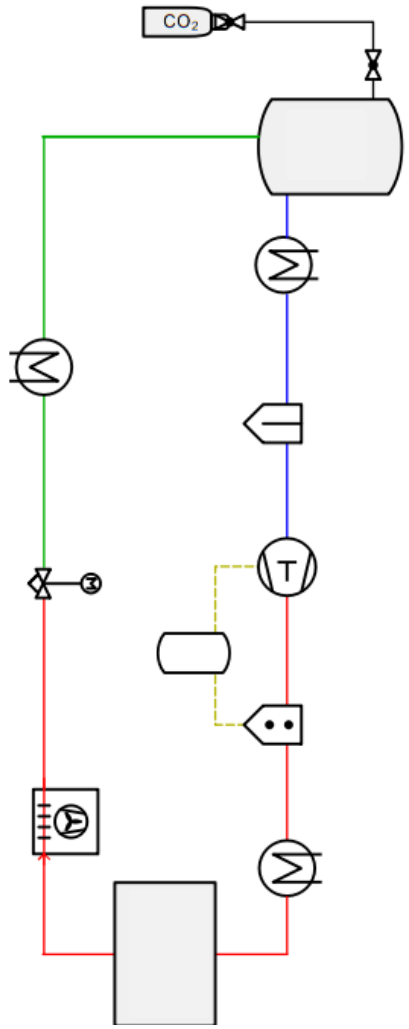

Figure 1: Schematic view of SCARLETT

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