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Titel des Beitrags: Optimal heat source temperature for supercritical organic rankine cycle

Abstract: Organic Rankine Cycle (ORC) enables power generation from low- to medium temperature heat sources. In an ORC, the organic medium shows different performances for different heat source temperatures. For a range of heat source temperatures, one temperature can be always identified corresponding to the best thermal match between the heat transfer fluid and working fluid. This temperature is defined as the Optimal Heat Source Temperature (OHST) and serves as an indicator for optimal efficiency. In this respect, the aim of this study is to investigate the OHST for supercritical fluid and its application in thermodynamic optimization. A simple ORC configuration is introduced and imposed with a set of constraints for establishing a cycle model. OHST is determined from parametric optimization and theoretical prediction, respectively. A comparative study is followed to examine the reliability of the theoretical prediction. In a subsequent case study, the OHST approach is compared with the conventional approach in thermodynamic optimization of a supercritical ORC. Optimal results from both approaches are compared, along with discussions and conclusions for further studies.

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