Friedrich-Alexander-Universität
Technische Fakultät

The Institute of **Advanced Optical Technologies - Thermophysical Properties (AOT-TP**) offers

Master Theses

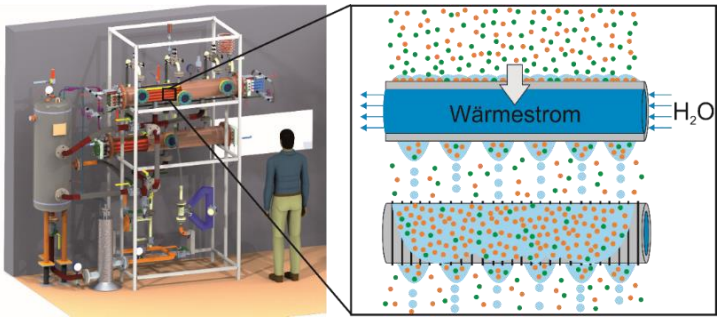
in connection with the research topic

Modeling of the heat transfer coefficient in the condensation of binary hydrocarbon mixtures on the outside of horizontal pipes

In the course of the increasingly noticeable climate change and the accompanying political restrictions on the emission of greenhouse gases, it is the task of research to develop ways of reduce the emission of gases that are harmful to the climate. In addition to reducing CO_2 emissions, it is also necessary to replace conventional refrigerants with high GWP (Global Warming Potential) values with non-climate-damaging refrigerants with appropriate thermophysical properties. Due to their low GWP values, hydrocarbons and hydrocarbon blends are forward-looking, and the use of the latter has some decisive advantages. For example, they can often be used as so-called "drop-in" solutions in systems where the previously used refrigerant has been banned.

Since the condensation behavior of hydrocarbon mixtures on smooth or finned individual tubes and tube bundles has not yet been sufficiently investigated, the heat transfer during condensation is studied in a research project, funded by the Bavarian Research Foundation, at the AOT-TP in cooperation with Wieland-Werke AG.

In addition to the experimental determination, the heat transfer from the tube surface to the gaseous binary refrigerant mixture will also be theoretically modeled in this project. Based on measurement results, established models will first be validated and compared. Based on this, existing models for the heat transfer coefficient on the outside of the tube will be further developed in order to describe influences such as subcooling, surface modification and material composition of the tubes, as well as the thermophysical properties of the refrigerants on the heat transfer coefficient.



To support work within the described research topic, we are looking for dedicated students with an interest in thermal engineering, optical metrology and thermophysical properties. We offer an open, multidisciplinary and international working environment with excellent potential for scientific and personal development.

Start: as soon as possible

Contact:

Julius Kühl
E-Mail: julius.jk.kuehl@fau.de
Tel.: 09131-85-23022

Tobias Klein
E-Mail: tobias.klein@fau.de
Tel.: 09131-85-25843