Real Gas Effects in Heat Pump Flows

Abstract:
In heat pumps, the pressure drops during the rapid expansion over the throttling valve. Consequentially, the temperature of the working fluid (the so-called refrigerant) decreases, which evaporates partially. The cold working fluid can absorb heat from the ambient until the phase change is entirely completed.

The properties of the refrigerant are essential for the cooling capacity and thus, the efficiency of the heat pump. Numerical optimisation is performed to screen the best working fluid for the application.

The challenge of this project is to implement the equation of state into a fluid-dynamic simulation code. The performance of refrigerants will be compared in two-dimensional flow predictions of the throttle.

Key aspects:
- Application-oriented project - ideal preparation for consulting work
- The perfect introduction to fluid dynamic simulations

Requirements:
- Motivation
- Programming skills
- Basic knowledge of fluid dynamics

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