

The background image shows a large, modern building with a prominent, tall, conical structure made of metal lattice. In the foreground, there are wide, light-colored stone steps leading up a grassy slope. Many people are sitting on the steps and walking on the grass. The sky is clear and blue.

# Triogen Turbine Optimization

*Properties SU2 and Coolprop*

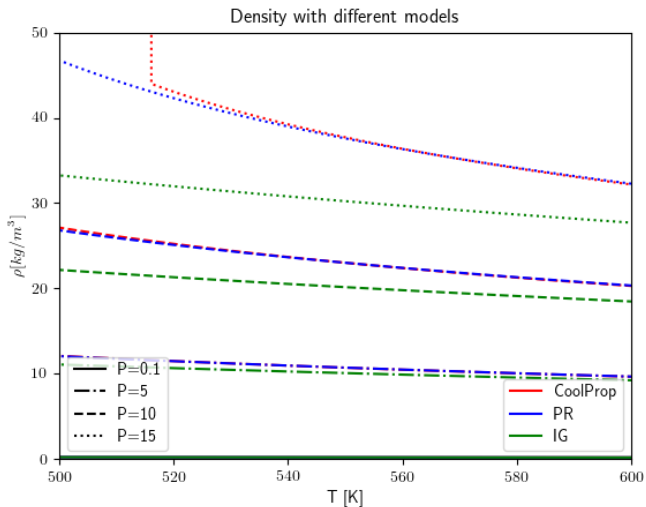
Delft University of Technology

Stephan Smit  
June 15, 2018

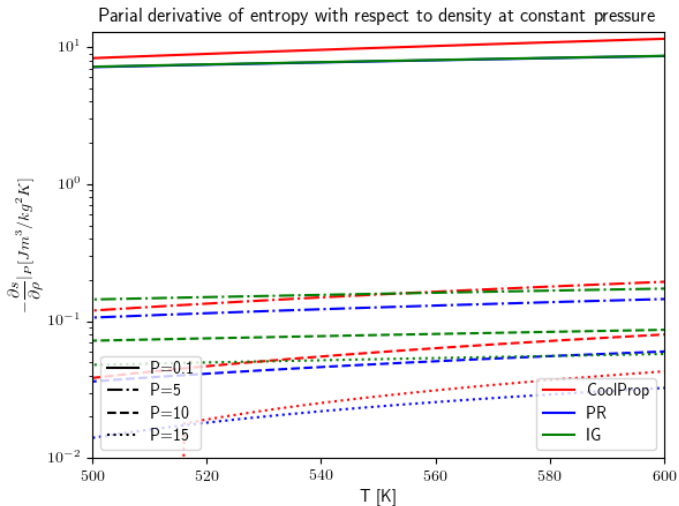
# Variable properties in SU2

- Incorporated the viscosity model and thermal conductivity model of CoolProp in SU2
  - Reference Correlation of the Viscosity of Toluene from the Triple Point to 675 K and up to 500 MPa (Avgari and Assael, 2015)
  - Reference Correlation of the Thermal Conductivity of Toluene from the Triple Point to 1000 K and up to 1000 MPa (Assael et al., 2012)
- Peng-Robinson Equation of state used for the thermodynamic properties
- In thermal conductivity model critical correction term not included
- Next figures will show the difference between de CoolProp EOS and the other EOS in SU2

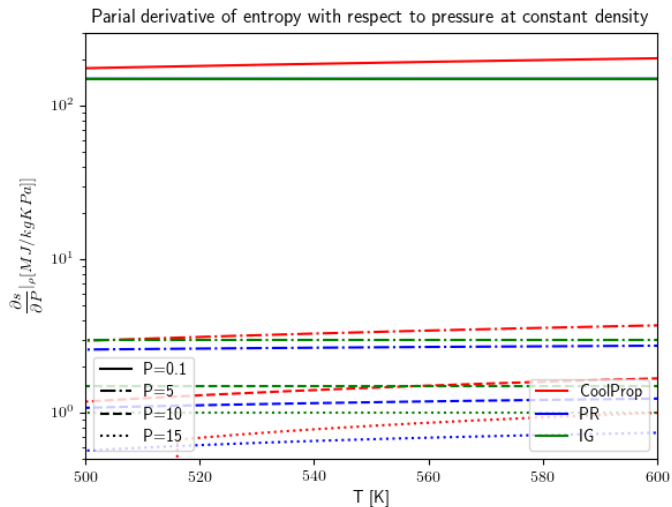
# Density



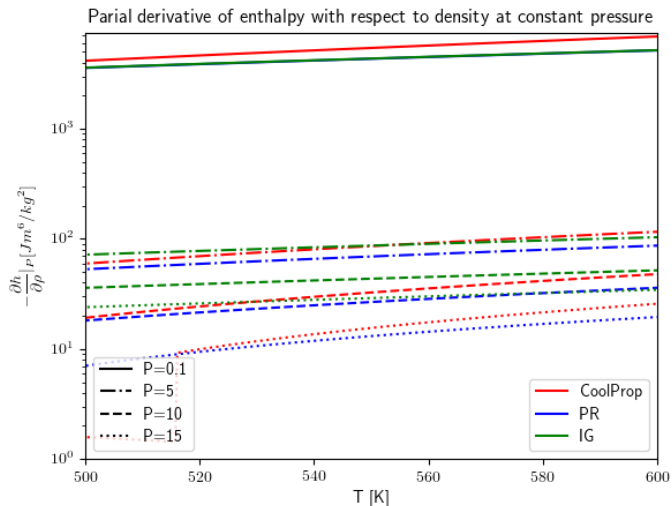
# Entropy at constant pressure



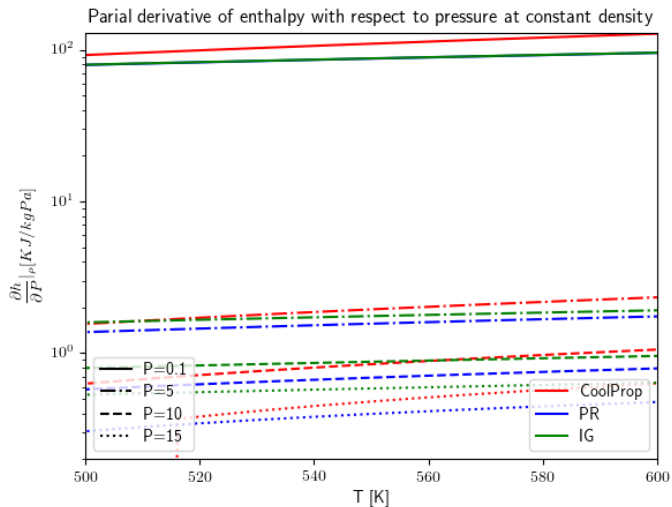
# Entropy at constant density



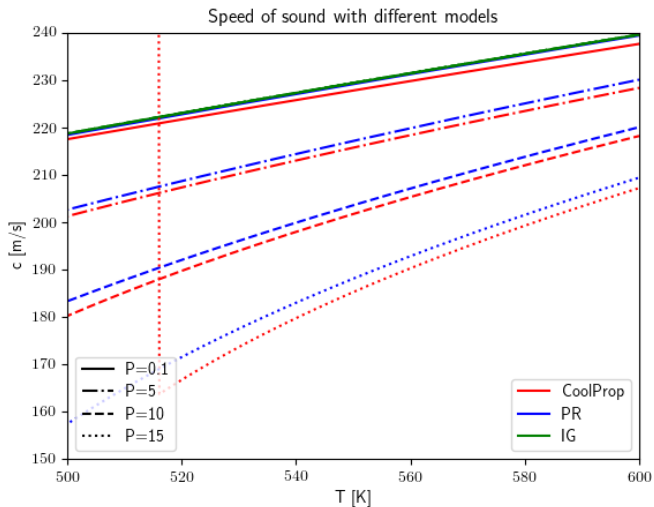
# Enthalpy at constant pressure



# Enthalpy at constant density

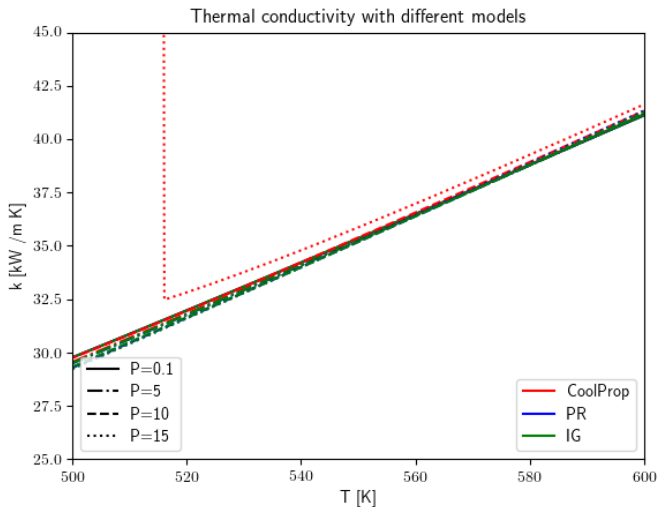


# Speed of sound





# Thermal conductivity



# Viscosity

