

# Interfacing Models for Thermal Separation Processes with Fluid Property Data from External Sources

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So far, when modelling processes that demand for multi-phase and multi-component fluid property data, the user has to implement the required media models in the Modelica language as these types of fluids are not supported by Modelica.Media. This paper presents a first approach on how to implement fluid property data in process models of an existing library from external sources and highlights which problems have to be overcome. Furthermore, it provides recommendations for the design of an efficient and user-friendly interface to external media packages.

Two approaches on the use of external property packages for the computation of fluid data interfaced to Modelica process models are compared to each other. With an exemplary column model from the ThermalSeparation library [1] using an explicit formulation of the balance equations the use of partial derivatives is avoided. This model is in terms of computational speed favourable in comparison to a model with an implicit formulation of the balance equations as illustrated in figure 1. However, especially when utilizing existing model libraries rewriting balance equations is not convenient or feasible. The paper shows that in this case the external property package has to provide partial derivatives of the fluid properties with respect to the system states.

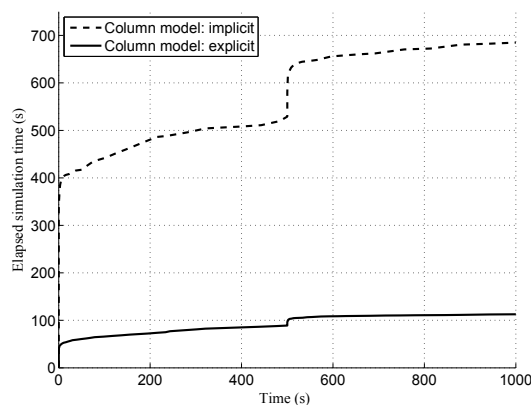


Figure 1: Comparison of simulation times.

## References

- [1] Dietl, K.: Equation-Based Object-Oriented Modelling of Dynamic Absorption and Rectification Processes, Hamburg University of Technology, Institute of Thermo-Fluid Dynamics, Hamburg, 2012, ISBN 978-3-8439-0778-1.