

Modelica Conference 2009



 **XRG**
XRG Simulation GmbH

Simulation

The **numerical simulation** plays an important role in the developing process of many technical systems. In particular **complex energy systems** can be analyzed in any detail under the most different boundary conditions using computer-based methods. Therefore, far-reaching **design decisions** can already be made in an early stage of the product development – with the aim to create efficient and sustainable **high-quality products**.

Company

XRG Simulation GmbH was founded to provide specialized simulation services and products to the development process of energy systems. Besides, our customers profit from the **close connection** between **research and development** which is an important part of our company philosophy. In multiple research projects **future methods** - such as model libraries - are developed which help to create new **innovative products**.

Research

XRG Simulation GmbH is participating in the following research projects:

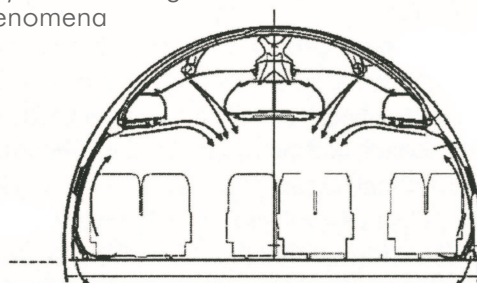


EUROSYSLIB - Modelica libraries for embedded systems modeling and simulation (funded by BMBF, Germany)

Within this project two innovative Modelica libraries are developed by XRG and our project partners.



FluidDissipation - A free library for modeling pressure loss and heat transfer phenomena

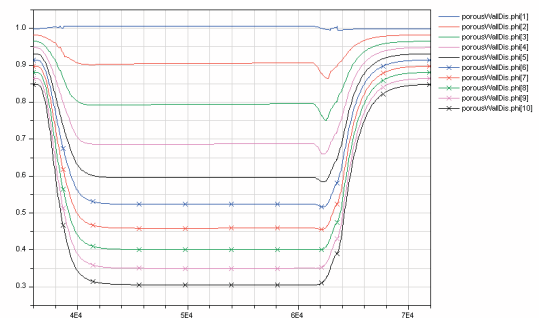


HumanComfort - A library for professional evaluation and visualization of thermal comfort in buildings and vehicles (distributed by Bausch-Gall GmbH)

MOHICAB - Modeling humidity in aircraft cabins (funded by BWA, Hamburg)



In this project Modelica models for analyzing humidity and heat flow in air craft cabins and insulation materials are build up and validated with measurements. Furthermore, a Dymola-Excel® interface enables data transfer between different Modelica simulation models and result post-processing in Excel®.



OPENPROD - Open Model-Driven Whole-Product Development and Simulation Environment (funded by BMBF, Germany)

Enhanced solvers for Differential-Algebraic-Equations are developed which aim to speed up simulations of complex systems. The solvers will be designed to be used with OpenModelica.

Services

With our services we support you straight in the **development process**. Just trust in our **flexibility** and that of our simulation models which cover the following **technical applications**:

- Thermo-hydraulic systems
- Energy supply systems (e. g. Heating, cooling and power supply in buildings and mobile applications, compressed air systems)
- Multi-domain systems (Coupling of electrical, thermodynamic, mechanical and control systems)
- Buildings and HVAC systems

Our offer is completed by **individual solutions** for the management, evaluation and presentation of simulation results. In addition, we develop for you

- Graphical user interfaces
- Measuring and control programs
- Fluid property calculations
- Optimization algorithms
- Simulation interfaces for co-simulation
- (Web-) Databases

Simply ask for it.

References

Daimler AG

Volkswagen AG

Airbus Operations GmbH

Imtech Deutschland GmbH & Co. KG

$$\int \frac{\partial \rho}{\partial t} dV + \int \operatorname{div}(\rho \vec{c}) dV = 0$$

$$\int \frac{\partial (\rho c_i)}{\partial t} dV + \int \operatorname{div}(\rho c_i \vec{c}) dV = \int \operatorname{div}(\tau_{ij}) dV + \int f_i dV$$

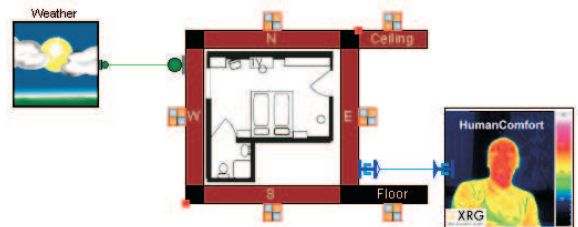
$$\int \frac{\partial (\rho e)}{\partial t} dV + \int \operatorname{div}(\rho e \vec{c}) dV = \dot{Q} + P$$

Products

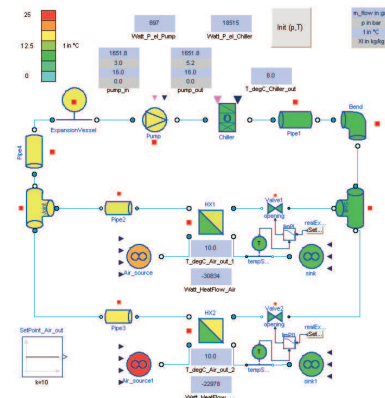
Modelica libraries

FluidDissipation - A free library for modeling pressure loss and heat transfer phenomena

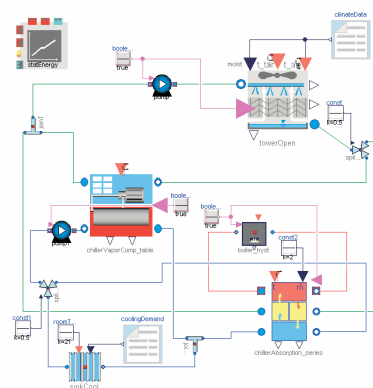
HumanComfort - A library for professional evaluation and visualization of thermal comfort in buildings and vehicles



Hydronics - Detailed modeling of steady-state and transient hydraulic networks



HVACLib - Modeling Heating, Ventilating and Air Conditioning Systems



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