

	Simulation Tool, Solver	Simulation Time, SSM	Simulation Time, SC
Variant 1	Dymola	25,2 sec.	14,8 sec.
Variant 2	Dymola	25,2 sec.	14,8 sec.
Variant 3	Simulink	25,3 sec.	65,4 sec.

Table 2, Simulation Performance of Different Interface Approaches

References

- [1] Niklas Philipson, Johan Andreasson, Magnus Gäfvert, Andrew Woodruff: Heavy Vehicles Modeling with the Vehicle Dynamics Library, Modelica 2008, March 3rd – 4th, 2008
- [2] MODELISAR consortium. Functional Mock-up Interface for Model Exchange. V. 1.0. <http://www.modelisar.org>, 2010

7. Summary and Outlook

The work presented demonstrates that a resolved multibody model comparable to an industry standard ADAMS model can be created with reasonable effort in a multidomain simulation environment like Dymola using the Modelica approach and according specialised libraries. Extensive validation work was invested to ensure that both models lead to comparable results.

From there on it was demonstrated that entire mechatronic system simulation is easily possible in multidomain simulation tools, using vehicle dynamics, electric, additional mechanical and control models. Manifold ways to interface Dymola and Simulink support flexible approaches and tool strategies to simulate multiphysical mechatronic systems and match the particular needs of a user’s specific development process.

It was shown that the described approaches have the potential to cover the needs of the upcoming challenges of e-mobility for system design.

Additional concepts to interface multidomain simulation tools like Dymola with control simulation tools like Simulink are under development at different places and promise an even tighter integration of the required tools.