

Dymola 2025x Highlights

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Highlights

Model development

- Variable-length parameter arrays
- Improved parameter management
- Better Git support

Simulation

- Faster simulation of Modelica functions
- New FMI co-simulation technology
- Dymola Modelica Compiler

Libraries

- ThermalSystems replaced by TIL Suite

Parameter arrays

Variable-length parameter arrays makes it possible to represent lookup tables in native Modelica, without the use of C code and external objects.

Parameter arrays can be initialize at simulation initialization, not translation. Dymola allows such arrays to fix the size when data is read. This is also supported in FMUs generated by Dymola.

model Test

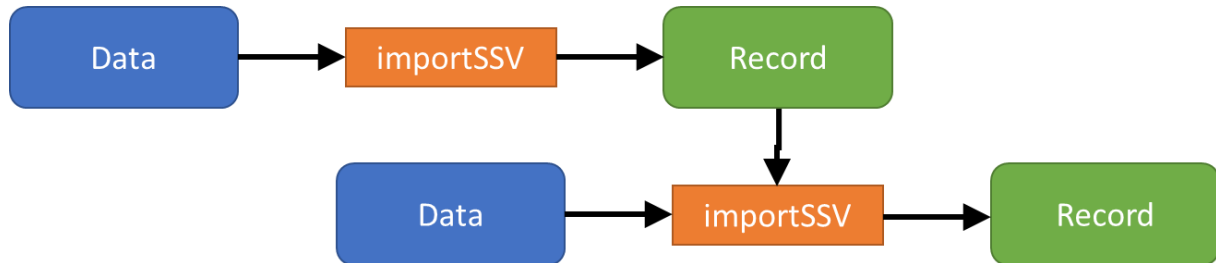
```
parameter Real p[:] = InitializeParameters("parameterfile.txt")  
  annotation(__Dymola_UnknownArray=true);
```

```
extends Modelica.Mechanics.Rotational.Examples.CoupledClutches(  
  J1(J=p[1]),  
  J2(J=p[2]),  
  J3(J=p[3]),  
  J4(J=p[4]));
```

```
end Test;
```

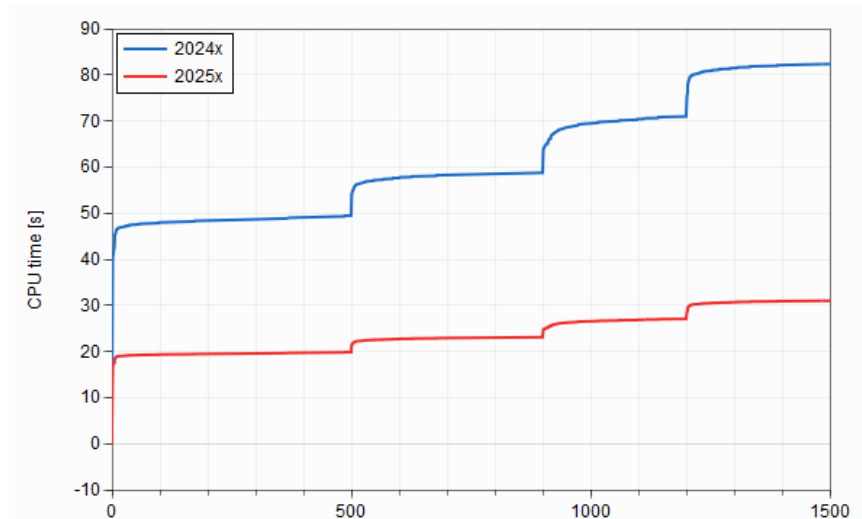
Parameter records

Parameter records in Modelica can be created by reading a data file in SSV or CSV format. It is also possible to let Dymola modify an existing parameter record. Data from the file include the name of the variable, default value, unit and description.



Simulation speed

Code generation for Modelica functions has been significantly improved, especially for array handling and with optimizations for constants and parameters. Typically, this has good effect in fluid systems with many function calls for media calculations. For example, the VaporCycle model from the ThermofluidStreams library runs more than 2x faster.



FMI co-simulation technology

We have implemented new co-simulation technology aimed to improve performance of “heavy” FMUs with variable-step solvers. For the right model it reduces the number of f-evaluations and Jacobian evaluations.

The fundamental idea is to smooth continuous-time Real inputs by linear interpolation during the next `doStep()` call. This means the numeric integrator can continue without costly resets, leading to larger step-size and fewer evaluations. Furthermore, a predictor compensation gives better error estimates. For a small but hard-to-solve model we get this improvement

Input smoothing	# f-evals	# Jacobian evals
Default	5471	499
Enabled	1851	14








TIL-Suite libraries

The existing ThermalSystems library is replaced by TIL-Suite from TLK-Thermo. This change will offer more complete range of libraries and extended functionality. It is divided into four library products at Dassault Systèmes:

- TIL Base Library
- TIL Mobile Air Conditioning Library
- TIL Hydrogen Library
- TIL Thermal Storages Library

There is a free upgrade for existing customers of ThermalSystems to TIL Mobile Air Conditioning Library. Please contact your sales channel.

Libraries for thermal components and systems

	TIL TIL library for thermal components and systems
	TIL Automotive TIL add-on with models and systems for automotive application
	TIL Heat Storage TIL add-on for thermal heat storage with temperature layers
	TIL PCM Storages TIL add-on for PCM-Storages (Phase Change Material)
	TIL NTU TIL add-on with steady state NTU heat exchangers and systems
	TIL Hydrogen Energy Systems TIL add-on for hydrogen energy systems
	TIL Adsorption TIL add-on for adsorption components and systems

Dymola Modelica Compiler

For toolchain integrators we now present the most minimalistic version of Dymola ever, the Dymola Modelica Compiler (DMC). It is a command-line tool that can translate models, simulate and run mos-scripts. It requires the usual Dymola license.