3DEXPERIENCE®

Dymola 2021x

Overview of new features

27 November 2020

DASSAULT SYSTEMES | The 3DEXPERIENCE® Company

Executive Summary

Editing and user interface

- Select which signals to hide and expose when importing FMU
- Routing connections around components
- On popular request: dark mode

Simulation

- Equation dependency graph for simulation analysis
- Static simulation up to 2x faster

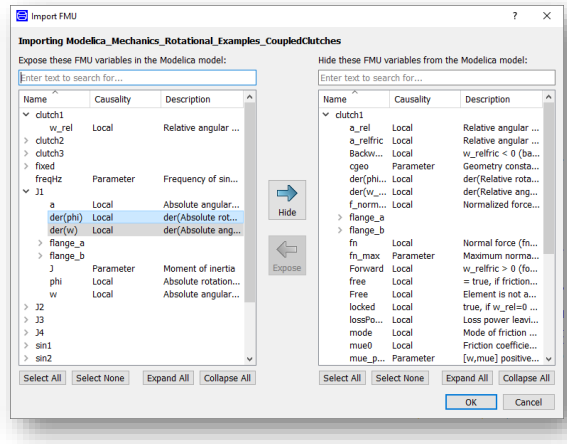
Libraries

- Modelica Standard Library 4.0.0

Editing and user interface

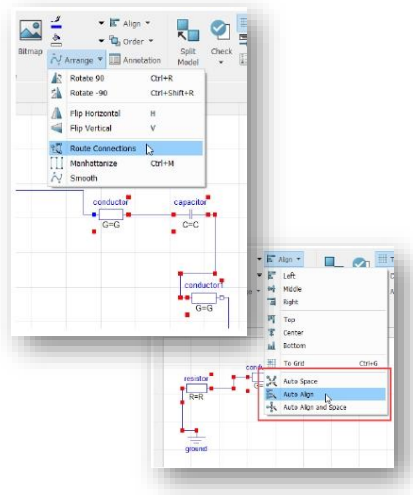
Functional Mock-up Interface

- FMU import
  - Select which signals to hide and expose when importing
  - Select package where to insert FMU wrapper model
- Directional derivative (co-sim)
  - List input, output, exposed state, and exposed state derivative value reference and names in model
- Linearize FMU
  - Select time and calculate ABCD matrices



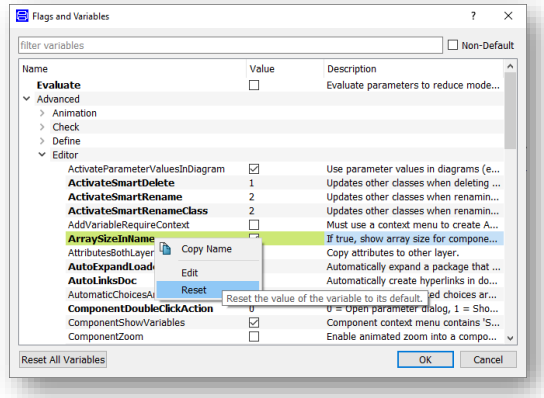
Graphical model editing

- Routing of connections
  - Routes connections around components
  - Tries to avoid other connection lines
  - Can be automatic or manual, see Tools>Options
- Arrange to ensure spacing and alignment of components



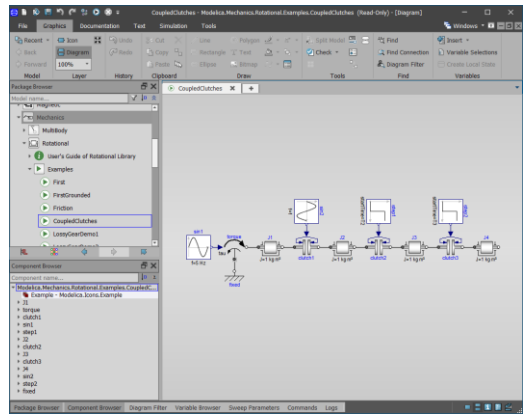
Variable setting dialog

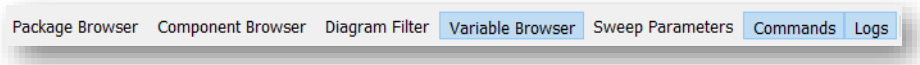
- Dialog for setting flags has been extended with all global variables
  - Boolean flags, numbers and strings
  - Context menu has Reset option
- Variable status
  - Variables in **bold** font are saved between sessions
  - Yellow background indicates non-default setting



User interface in general

- Drag multiple result files into Dymola window to load them
- Dark mode user interface
  - Command line option **`/dark`**
- Browsers and other docked windows easily enabled or disabled
  - Buttons in the status bar





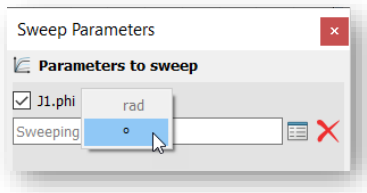
Simulation

Equation incidence

- Equation dependency graph for simulation analysis
- Show all variables in an equation system
  - Kind of equation system
  - Including discrete and torn variables
- Alternative views
  - Zoom in, zoom out
  - Rotate view
  - Compact view (trivial systems combined)

Simulation

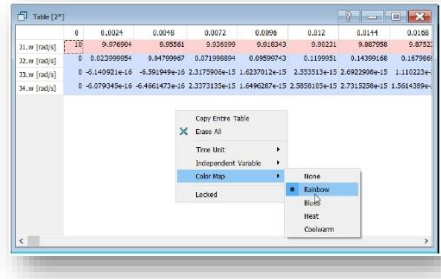
- Improved user interface for sweeping parameters
  - Redesigned dialog for improved clarity
  - Select unit on parameters



- Improved performance of static simulation
  - Lsodar, Dassl, Euler, or Rkfix solver
  - Set the stop time same as the start time (typically 0 to 0)
  - Up to 2x faster, depending on model
- Improved logging
  - Shorter messages for nonlinear eq. sys
  - Select what kind of event to log (time, state, or step events)

Plotting and tables

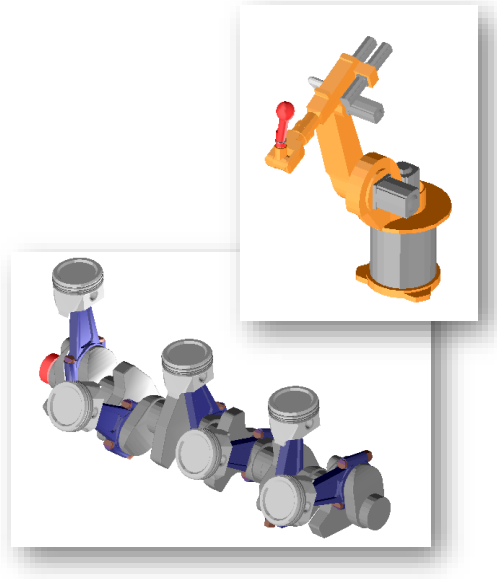
- Several improvements of plotting
  - ▷ New Layout ribbon tab to collect all layout and diagram ordering operations
  - ▷ Easier to create new multi-diagram plot windows
- Tables of simulation result data
  - ▷ Color-coded tables that shows relative magnitude of data in the table
  - ▷ Several color schemes available



Animation window

- Improved lighting model for animation
  - ▷ Gives more even and natural colors
  - ▷ Possible to adjust the ambient light
- Old style lighting model is available

```
Advanced.Animation.ExtendedLighting=false
```



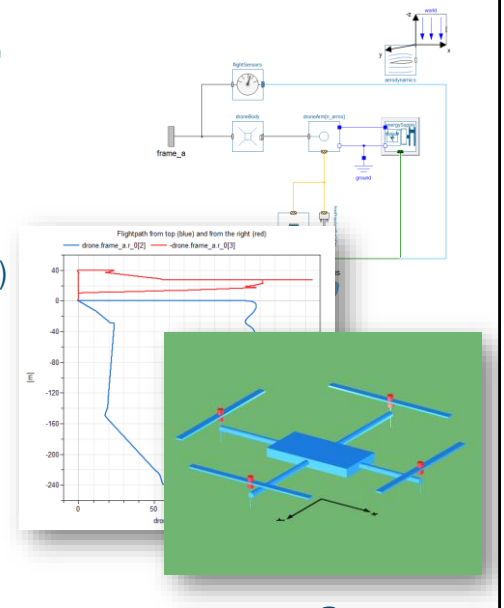
Libraries and environment

Modelica Standard Library 4.0.0

- Major new release of the Modelica Standard Library
  - Based on the recent Modelica Language Specification 3.4
  - Many improvements, bug fixes, clarifications
- Modelica.Clocked
  - Clocked systems fully supported by Dymola and now part of MSL
  - Was previously Modelica_Synchronous
- Migration
  - Automatic conversion of models when you open them in Dymola
  - All in-house and partner libraries migrated from 3.2.3 to 4.0.0
  - MSL 3.2.3 is available as a separate download if needed

Aviation Systems Library (AVY)

- Propulsion and aerodynamics of aircraft
  - Longitudinal dynamics of airplanes (fixed-wing)
  - Full dynamics of multi-copter drones (rotating-wing)
- Designed to connect to other libraries
  - Electrified powertrains
  - Multi-body library
  - Uses standard MSL physical connectors



Environment and licensing

- Dassault Systèmes license server
  - Available as an alternative to FLEXnet
  - Must be specified when you order license keys
  - FLEXnet is the default license server
- Dymola User Manual
  - Combined file also available
  - Makes searching easier
- Clarification of license conditions for code export
  - For the avoidance of doubt, internal use shall include redistribution of the Output File as embedded into Customer's products, but shall exclude redistribution of the Output File alone.
- OLE for Process Control (OPC)
  - No longer supported as a built-in feature
  - Contact support if you need an alternative