



3DEXPERIENCE

Dymola 2015

Overview of new features

6 June 2014

 | The 3DEXPERIENCE Company

Executive Summary

Standardization and integration

- Modelica compliant – tested against official Modelica test suite.
- Easier tool chain integration with Java and Python scripting interfaces.
- Full 32-bit and 64-bit support on both Windows and Linux.

Modeling and simulation

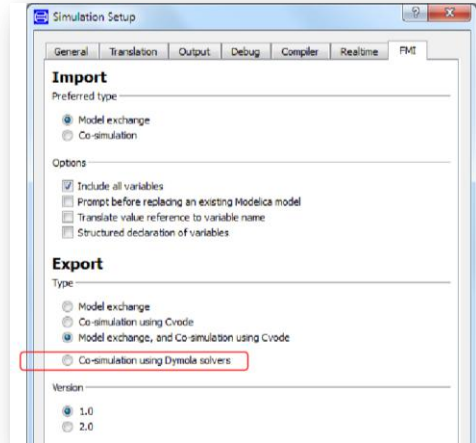
- Improved model creation from existing components handles global data and parameter propagation automatically.

New model library

- Flight Dynamics library for flight load analysis, control law design, mission simulation and aircraft design analysis.

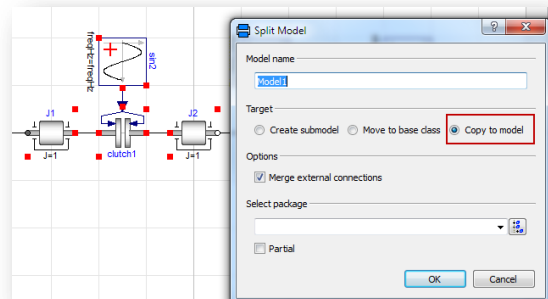
FMI Highlights

- ▶ Full support of FMI 2.0 RC1
- ▶ Support of all Dymola solvers for binary FMU co-simulation export (FMI 1.0 only)
- ▶ 64-bit FMU export on Linux and Windows
- ▶ General improvements and bug fixes
 - ▷ String parameters
 - ▷ UNC path
 - ▷ External resources
 - ▷ Handling of many inputs/outputs
- ▶ Online tunable parameters



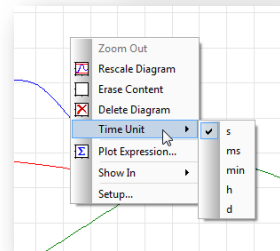
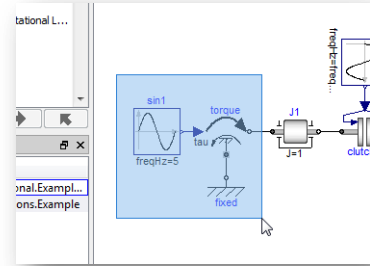
Dymola Highlights – Split Model

- ▶ Improved model creation from existing components
 - ▷ Copy to new model
 - ▷ Manages global data (inner/outer) automatically
 - ▷ Parameter propagation



Dymola Highlights – User Interface

- ▶ Simplified zooming of the diagram layer
 - ▷ Span rectangle around zoom area
 - ▷ Fit to Window zooms out
 - ▷ Easier to manage large complex models
- ▶ Improved plotting
 - ▷ User-defined time unit on horizontal axis
 - ▷ Heading text style can be changed



Dymola Highlights – Tool Integration

- ▶ Improved scripting for tool chain support
 - ▷ Improved Java interface
 - ▷ New Python interface
- ▶ On-demand loading of Modelica models
 - ▷ Faster loading of large model libraries

```

from dymola.dymola_interface import DymolaInterface
from dymola.dymola_exception import DymolaException

dymola = None
try:
    # Instantiate the Dymola interface and start Dymola
    dymola = DymolaInterface()

    # Call a function in Dymola and check its return value
    result =
dymola.simulateModel("Modelica.Mechanics.Rotational.Examples.CoupledClutches")
if not result:
    print("Simulation failed. Below is the translation log.")
    log = dymola.getLastErrorMessage()
    print(log)
    exit(1)

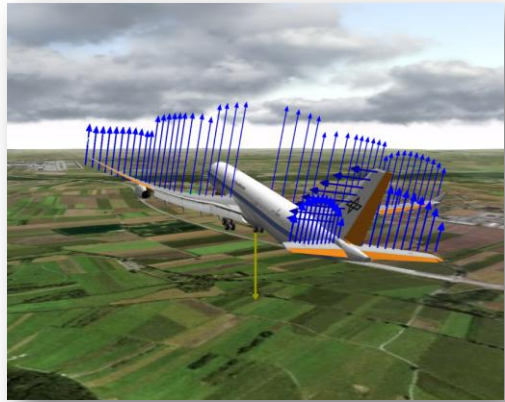
    dymola.plot(["J1.w", "J2.w", "J3.w", "J4.w"])
    dymola.ExportPlotAsImage("C:/temp/plot.png")
    print("OK")
except DymolaException as ex:
    print("Error: " + str(ex))
finally:
    if dymola is not None:
        dymola.close()
        dymola = None

```

Flight Dynamics Library



- ▶ Flight Dynamics Library for modeling all kinds of aircraft
- ▶ Fast parametric models for
 - ▷ Real-time simulation (simulators, HIL/SIL testing)
 - ▷ Flight loads analysis
 - ▷ Control law design
 - ▷ Mission simulation
 - ▷ Aircraft (pre-)design analysis



DLR Robot Motion Simulator

- ▶ Novel flight simulator design
 - ▷ Big 6 DOF industrial robot
 - ▷ Horizontal track 10 meters long
 - ▷ Two-seat cockpit
 - ▷ More flexible than hexapod configuration
- ▶ Combines flight dynamics and robot simulation
 - ▷ Extensive mathematical modeling of behavior



Compilers and Environment

- ▶ Support for GCC compiler on Windows
 - ▷ FMU export, DDE, OPC, DLL not supported
 - ▷ No support for runtime license (FlexNet does not support GCC on Windows)
 - ▷ Only 32-bit support
- ▶ Native 64-bit support on Linux
 - ▷ Requires media download, see www.dymola.com/Linux for details
- ▶ Updated FLEXnet version (11.11)
 - ▷ Improves robustness of license borrowing
 - ▷ Backwards and forwards compatible with earlier versions of Dymola

MinGW
Minimalist GNU for Windows

Dymola 2015 – Library Summary

▶ Air Conditioning Library	1.8.7	▶ FlexibleBodies Library	2.1
▶ Engine Dynamics Library	1.2.1	▶ FlightDynamics Library	1.0 (new)
▶ Electric Power Library	2.1.1	▶ PowerTrain Library	2.2.1
▶ Fuel Cell Library	1.2.1	▶ Optimization Library	2.2.1
▶ Heat Exchanger Library	1.1		
▶ Hydraulics Library	4.0		
▶ Hydro Power Library	2.4	▶ Smart Electric Drives Library	1.4.4
▶ Liquid Cooling Library	1.2.1		
▶ Pneumatics Library	1.6.2		
▶ Thermal Power Library	1.8		
▶ Vapor Cycle Library	1.1		
▶ Vehicle Dynamics Library	1.9		

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