MATLAB EXPO 2016

## Schneller modellbasiert entwickeln mit Simulink in R2016a

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Automatic Solver Option

Set up and simulate your model more quickly with automatically selected solver settings

- Simulink will select a solver and step size that is optimized for your specific model
- Considers factors such as model stiffness and simulation performance
- All new Simulink models use the automatic solver option
- Can optionally lock down solver so that it does not change from one simulation to another
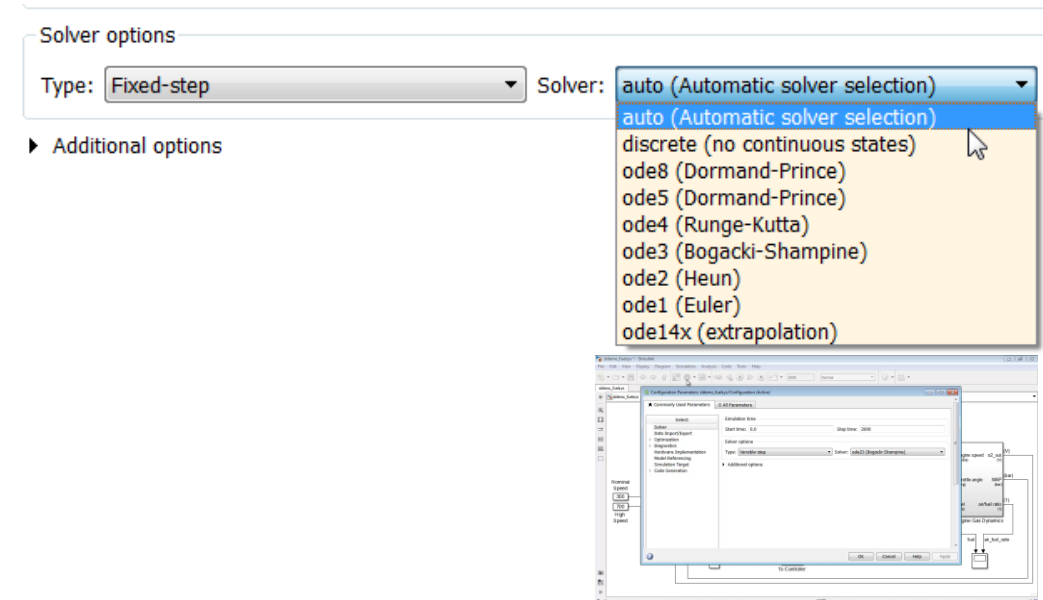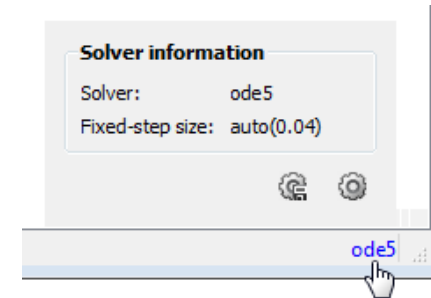
Simulink Solver Profiler

## Troubleshoot simulation issues with detailed solver profiling data

- The solver profiler logs and reports all the events when the solver tries to take too large step:
  - Zero-crossing event
  - Tolerance exceeded
  - Newton Iteration failure
  - Newton iteration for DAE failure
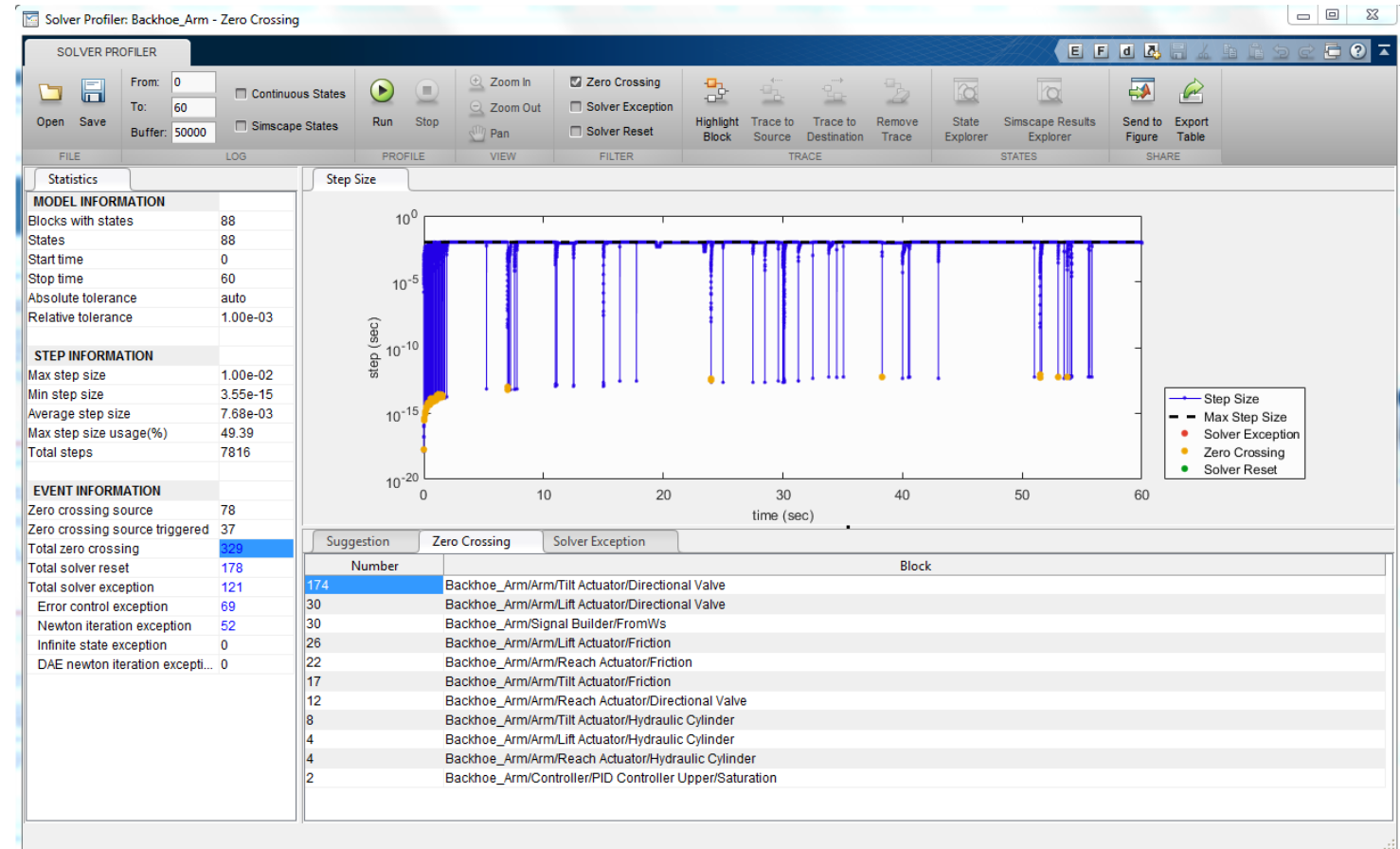
Simulink Units

**Specify, visualize, and check consistency of units on interfaces**

- Specify physical units for Simulink signals and bus elements at the interfaces of components such as subsystems, model references, Stateflow charts and MATLAB function blocks

- Identify unit mismatches at the component interfaces

- Enforce consistency is by restricting the unit systems for certain components using the configuration parameter, 'Allowed unit systems'
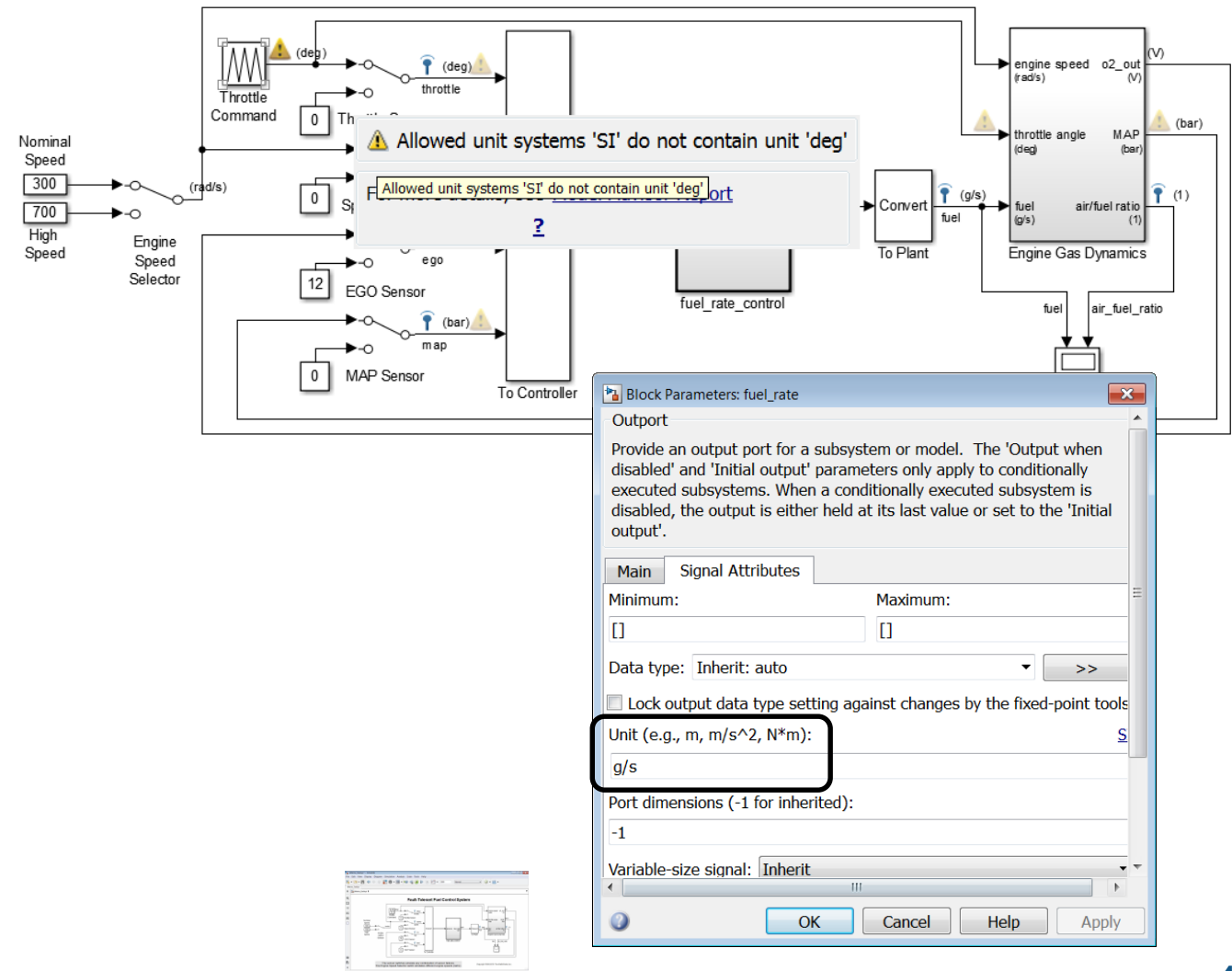
Single-Selection Actions

**Access commonly used editing actions when clicking a block or signal line**

- Select a block or signal line in a Simulink and a cue appears that lets you select a common action to perform

- For blocks, you can comment or uncomment the block or hide or display the block name using this cue

- For signal lines, you can autoroute the line or enable or disable signal logging
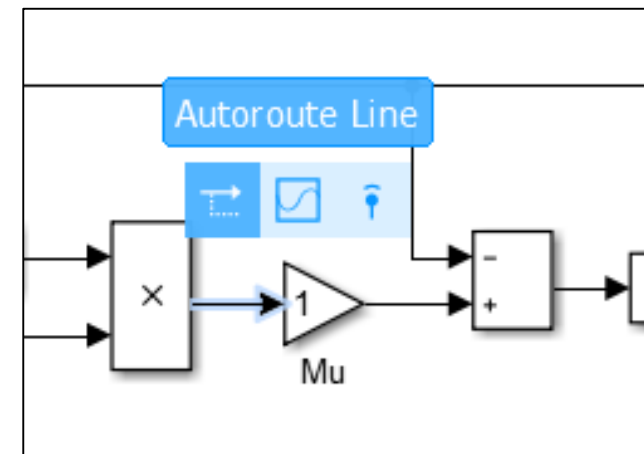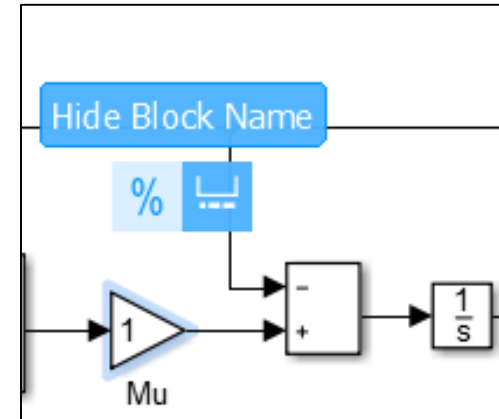
One-Click Display

**Click a signal line when the simulation is running to view the current value**

- Display port value for a signal by clicking it during simulation for easy debugging

- For bus signals, select the signals of interest before simulation
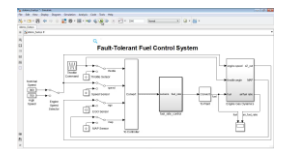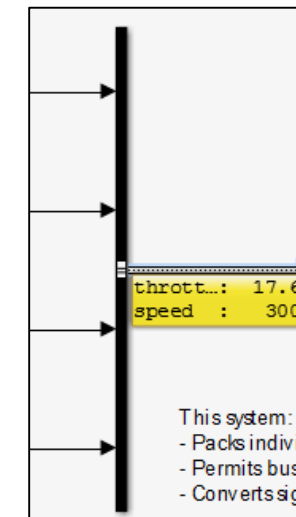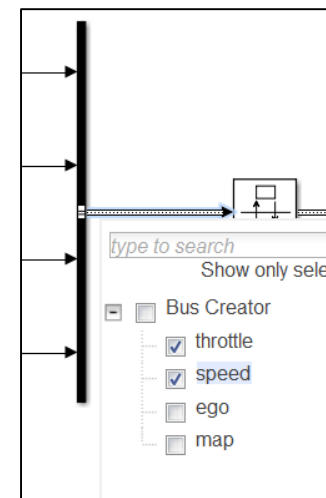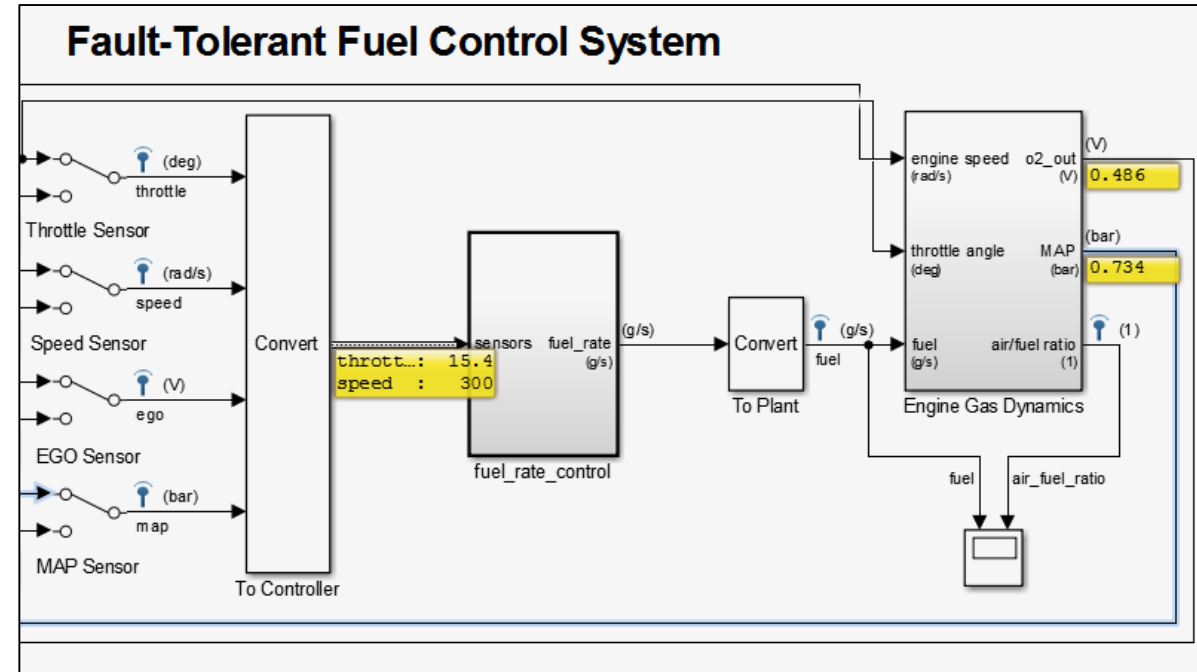
Variant Source and Sink Blocks with Condition Propagation

**Design variant choices and automatically remove unneeded functionality based on block connectivity**

- Add variants that are graphically available in the editor and not encapsulated.
- Variant conditions are propagated to other blocks based on settings in the model
- Variant annotations and the Variant Conditions Legend are used to better understand condition propagation
- You can generate code for either the active variant choice or generate preprocessor conditionals using Variant Source and Sink blocks.
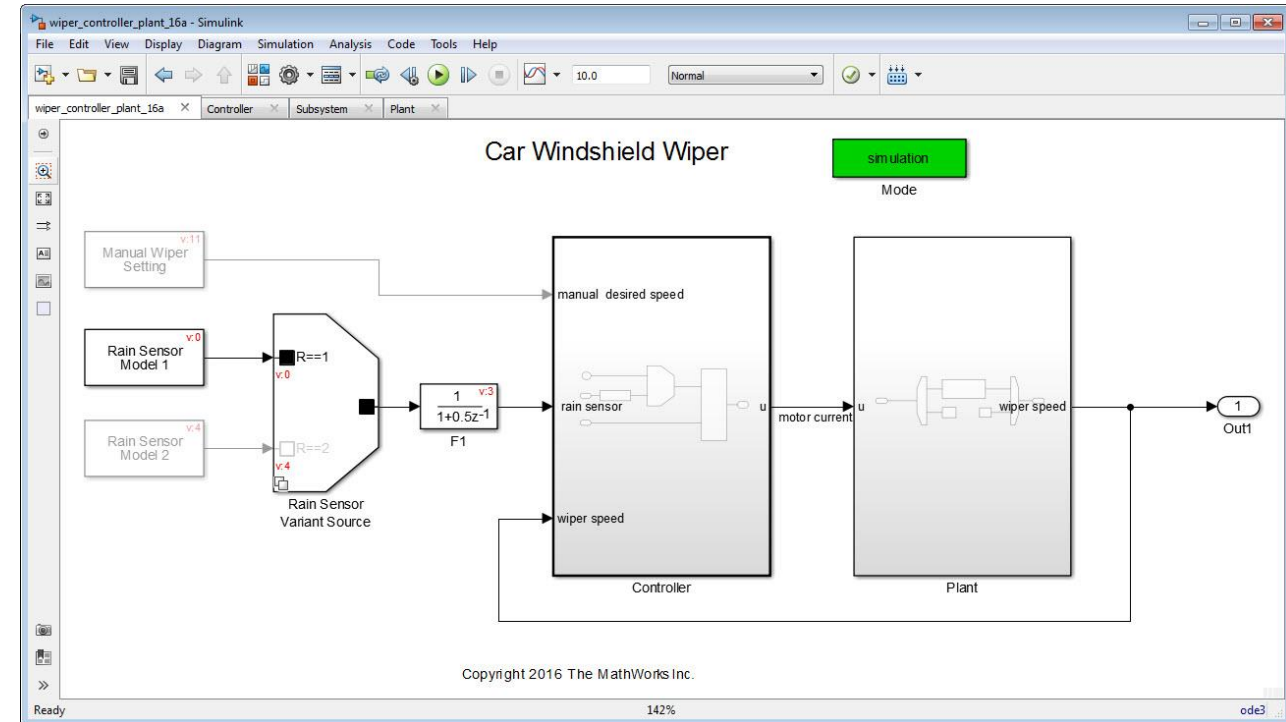
Simscape
Run-Time Parameters

- Change parameter values without recompiling the model

- Uses:
  - Fast Restart in Simulink
  - Model Reference
  - HIL (SLRT or ERT target)

- Enable via MATLAB preferences
  - New drop-down on blocks (shipping and custom Simscape blocks)
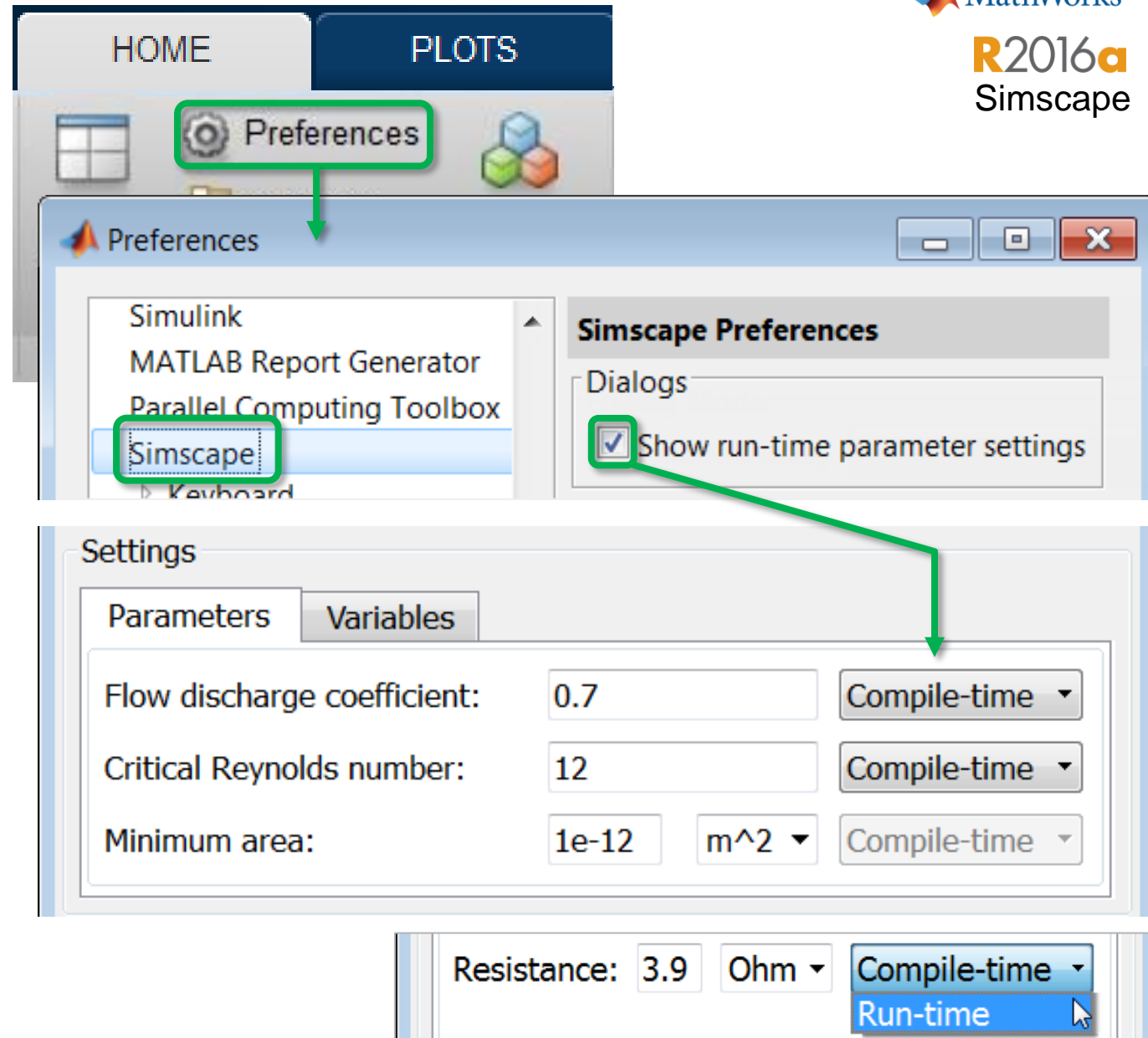
Sensitivity Analysis
Determine most influential parameters in your Simulink model

- Run Monte Carlo Analysis on Simulink Model

- Find Sensitivity of System Output depending on Parameter Tolerances
  - Increase Reliability & Robustness

- Find a good initial point for a design optimization session
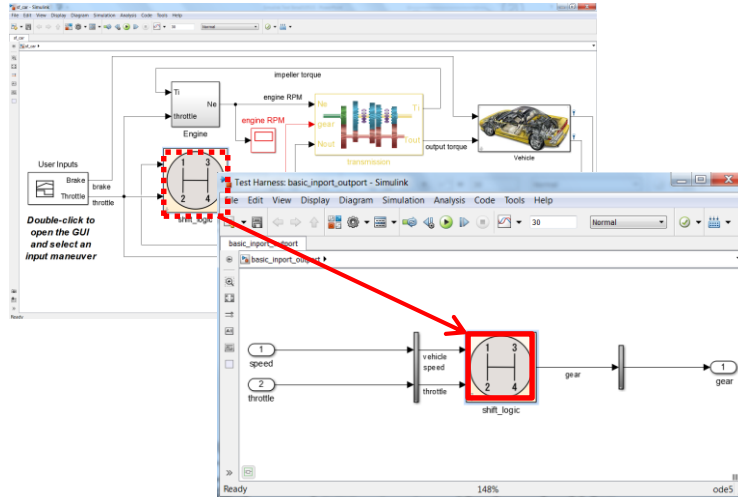 - Improve Performance
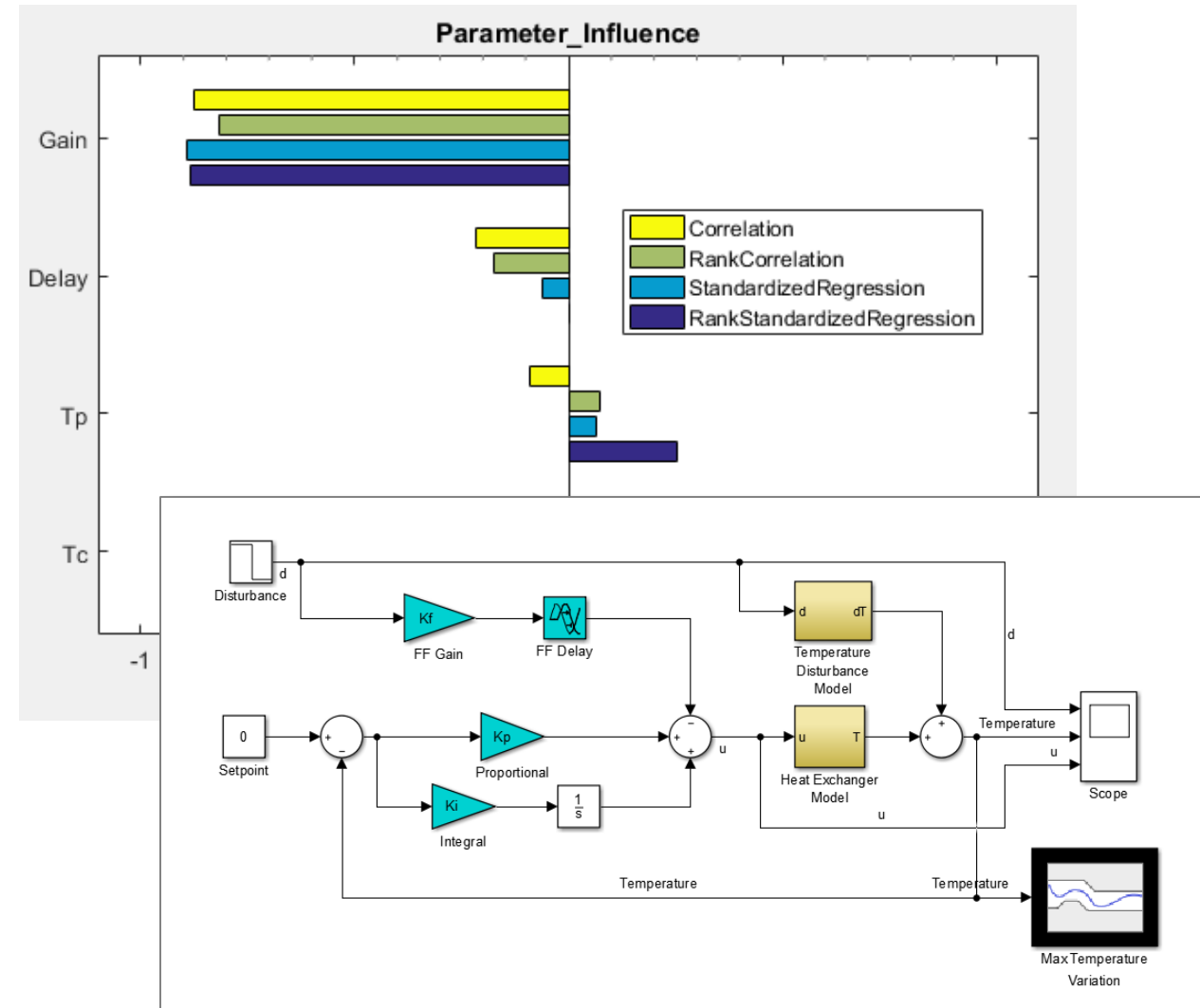
Three-Way Model Merge

- Graphically view and merge models when working in team setting
- An interactive comparison report with the two conflicting designs along with the original base model
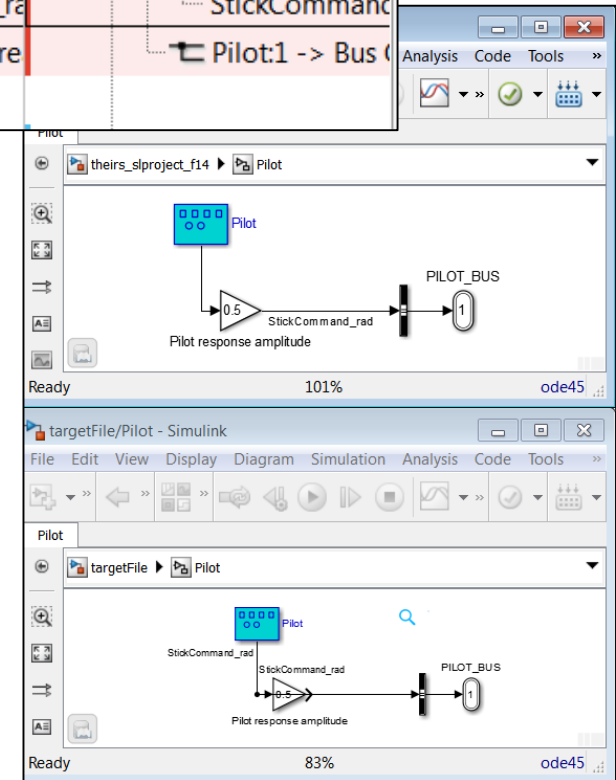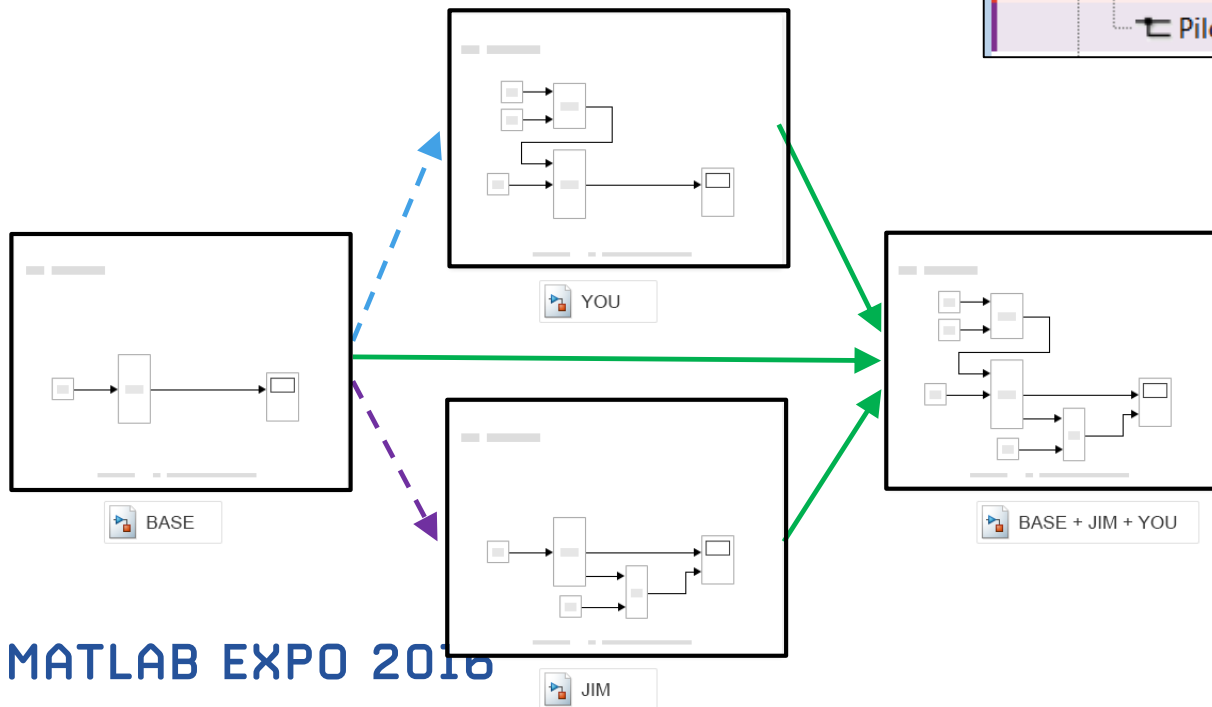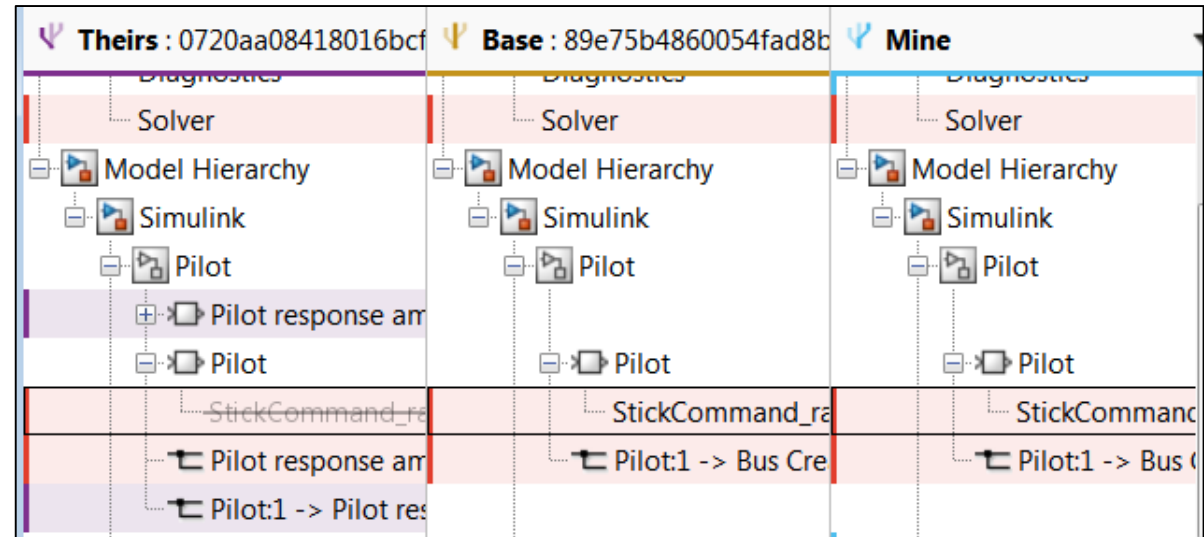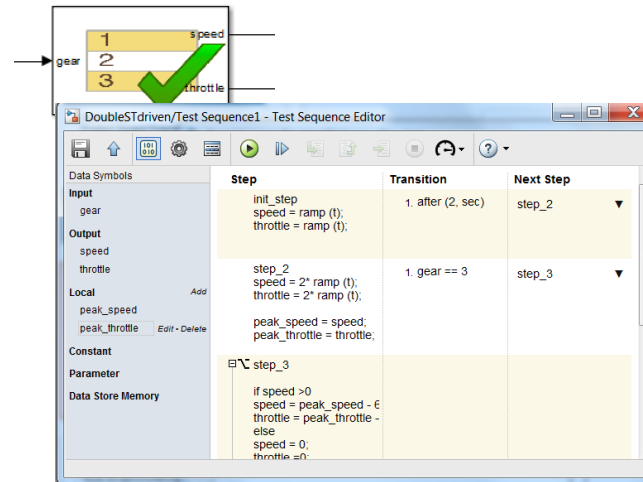
Authoring, Managing and Executing Tests
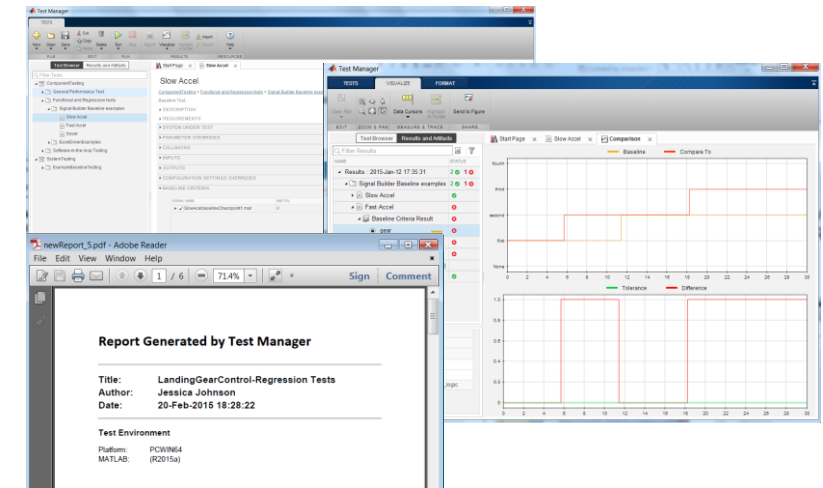
Test Harnesses

- Harness list dialog
- **Library harnesses**
- Simulink functions/export function models support (AutoSAR)
- **Externally-saved harnesses**
- Requirements linking

Test Sequence Block

- Syntax highlighting
- Tab completion
- Enhanced symbol sidebar
- Message I/O, function call
- Description column
- "verify" statement
- API
- Requirements linking

Test Manager

- **Coverage**
- **Parallel test execution**
- **Report customization**
- Iterations
- Dependency/impact analysis
- Test for subsystems
- **Real-time test cases (SLRT)**