IGNITE 2018.1 New Features
IGNITE is a Modelica-based environment for the modeling and simulation of complex physics-based systems.

- Complete Complex System Modeling
  - Thermal System Modeling
  - Vehicle Dynamics
  - Powertrain / Systems Integration
- Duty Cycle Simulation
  - Performance & Fuel Economy Prediction
- Hybrid System Design
- Vehicle Dynamics
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- Complete Complex System Modeling
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What is IGNITE?

A flexible, integrated Modelica based environment for multi-domain systems analysis
Libraries to cover different cross domain problems containing various fidelity components
IGNITE Key Characteristics

- Ricardo library development
  - Powertrain
  - Controls
  - Vehicle Dynamics
  - 1-D thermal fluid

- Growing Support for Modelon Libraries
  - 7 Modelon libraries supported as of 2017.1

- Flexibility by Functional Mock-up Interface
  - OCT Solver

- Co-Simulation Interface
  - WAVE-RT & RCAT (1-D gas-dynamics engine coupling, emissions)
  - MATLAB/Simulink (detailed control system integration / development)

- Postprocessor / Design & Optimization via HEEDS
• Release featuring
  – IMoved library for vehicle dynamics applications
  – Powertrain library fixes
10 DOF Vehicle Assembly

- Prepopulated skeleton components
- Data access via reference objects
- Interfaces for external connections
- Visualization template
  - IMoved library for vehicle dynamics applications
  - Powertrain library fixes
Vehicle Simulation - Animations

- Visualization
  - Road profile
  - Forces
  - Tire contact
  - Vehicle frame
  - Suspension geometry
  - Motion
- Results automatically generated from IGNITE
- Camera to follow objects
- Component tree
  - Case comparison
  - Visibility control
- Animation controls
  - Replay and loop
  - Animation speed

capability and usability
Tire Data Import for Magic Tire

- Tire data container reading standard TIR file
- Data import via copy/paste from MS Excel
- Option to link the tire properties to IGNITE parameters for tire related parametric studies
Road definition and design

- Road animation
- Path definition as a sub-element of the road
- Vertical profile imposed on the surface
  - Defined retarders or potholes on the road patch
  - Defined by the road data measurement
  - Currently a single point of contact (given by the tire model used)
- Bank angle and gradient profile
Connection to the Powertrain Library

- IMoved fully compatible with Powertrain Library
- Interfaces support building different layouts
- PathDriver replacing the CycleDriver
- The impact of the powertrain changes on the vehicle handling
Link to RPOST
definition of the custom templates
Components overview

Axles
- Trailing Arm
- Suspension Basic No Steer
- MacPherson Steer
- Torsion Beam

Roads
- Straight Road
- Circle Road 1
- Table Road XY
- Table Road XYZ

Differentials
- Differential
- TSen Differential
- VCD Differential
- Differential Control

Drivers
- PathDriverSteerOnly_1
- PathDriver