

## Highlights:

Built-in two-way coupling with 3D CFD (CONVERGE(TM))

Highly flexible and intuitive user interface for any reaction mechanism

Advanced Adaptive chemistry solver for stiff non-linear systems

Fast and efficient Quasi-Steady solver compatible with real time solver

Quasi 2-D/3-D flow/thermal modeling of DPFs and catalysts

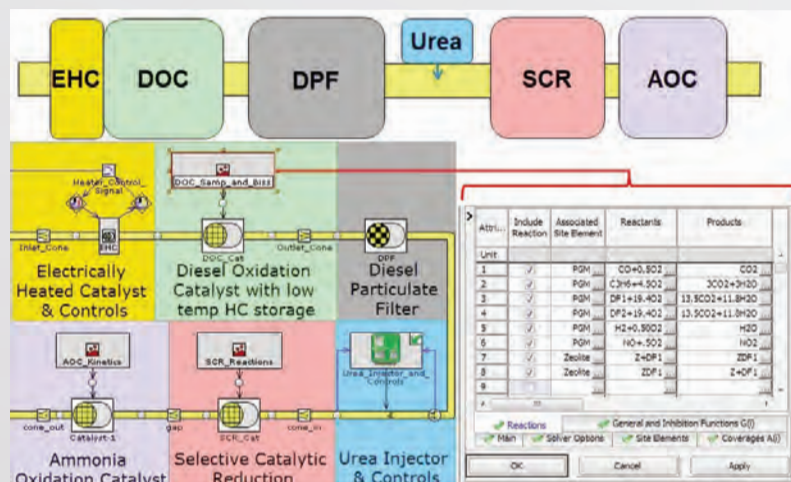
Built-in direct and DOE optimizers for kinetic parameter calibration

## Exhaust Aftertreatment

### Flexible Kinetics Solution for Aftertreatment Devices

GT-POWER includes a complete chemical kinetics and aftertreatment (AT) device library that enables the user to model any AT device in isolation or within an integrated system, while providing the user the **complete flexibility to modify and impose the participating kinetic mechanisms**. The design of this library is consistent with our goal to provide a single tool for simulation of all aspects of engine and vehicle systems. This library allows modeling of AT systems **together with vehicle, engine, thermal management, and control systems**, making this tool uniquely suitable for collaborative development. The most important features of this library are as follows:

- Highly intuitive and completely flexible input for specifying reaction mechanisms using GT-ISE graphical user interface
- Supports modeling of all catalysts and filters (TWC, DOC, LNT, DPF, Catalyzed-DPF, SCR-DPF, SCR, AOC, etc.) as well as future reactors being researched
- Numerically efficient and robust Advanced Adaptive chemistry solver with adaptive mesh that adapts to the local reaction front to solve the stiffest non-linear reaction-diffusion problems at speeds typically orders of magnitude faster than real time
- Advanced pore diffusion model in flow-through catalyst supporting dual washcoat layers
- Detailed fully-discretized wall-flow particulate filter model including diffusion in inlet channel, soot cake layer, substrate wall, and outlet channel
- Single integrated tool, no 3rd party tools required, no compiler required
- Built-in direct and DOE optimizer tools for kinetic parameter calibration
- Proprietary models can be encrypted by the user for distribution outside the organization
- Library of state-of-the-art mechanisms of each catalyst and DPF application provided to all users as starting models



## Advanced Features and Applications:

Capable of modeling:

- DOC
- LNT
- DPF
- Catalyzed DPF
- SCR-DPF
- SCR
- AMOX
- TWC
- Any state-of-the-art catalyst under development

Run as a standalone model or as a part of an integrated system comprising engine, vehicle and control sub-systems

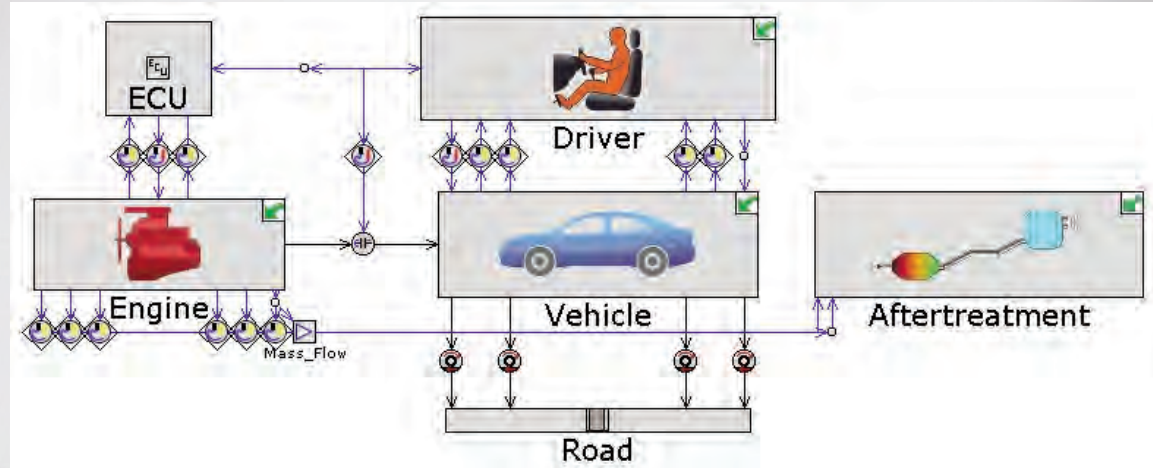
Virtual coupling with other sub-systems to achieve RT performance without sacrificing accuracy

Designed for use with reagent control and regeneration strategies

These capabilities are included in every GT-SUITE license

## Efficient Solvers Compatible with RT Simulation

- The fast and efficient Quasi-steady (QS) flow solver is compatible with RT model requirements for system simulation
- Using built-in tools, AT models can be transformed into neural network (NN) models to achieve 1-2 orders of magnitude higher computational speed for XiL applications
- Complex integrated model can be virtually sectioned into separate circuits in order to achieve RT performance without sacrificing accuracy and interactions between the sub-systems



Quasi 2-D/3-D flow/heat transfer modeling to simulate **multi-D behavior of AT components**. Non-uniform distributions of flow rate, temperature, and all species can be supplied to the AT model.

