

## Highlights:

Highly flexible and intuitive input processors for mechanisms

Varieties of ODE/DAE solvers available for stiff DAE systems

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

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

Detailed thermal modeling for solid temperature distribution of catalyst with thermal library

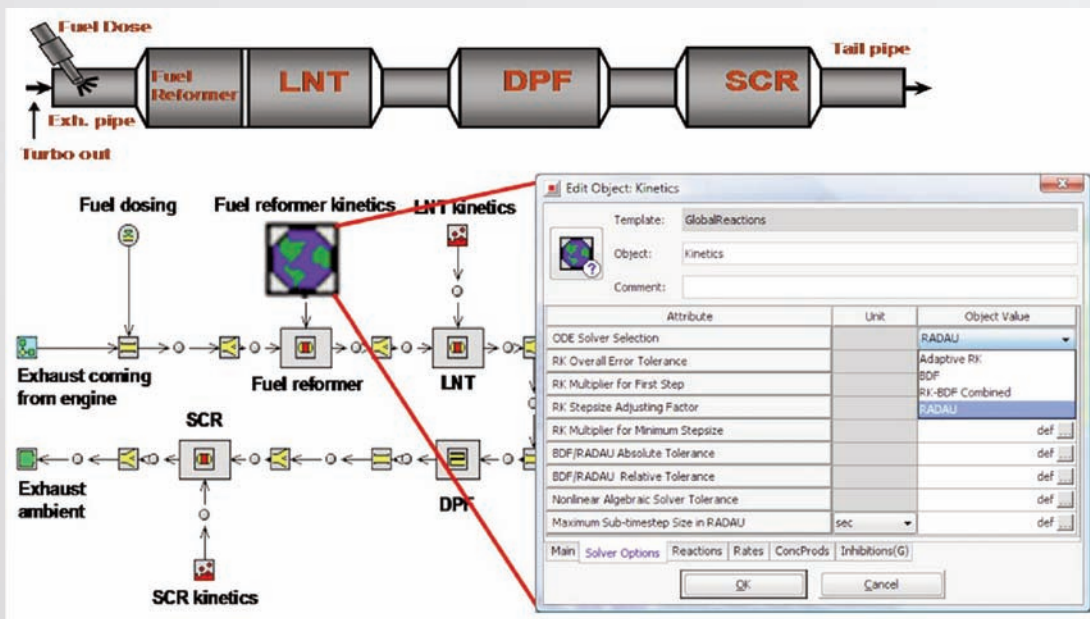
Built-in direct and DOE optimizers for parameter identification

## Exhaust Aftertreatment

### Flexible Kinetics Solution for Aftertreatment Devices

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

- Highly intuitive input processor that uses existing GT-ISE graphical user interface
- Single integrated tool (no 3rd-party tool is required)
- Completely flexible in terms of specifying catalytic mechanisms
- Allows modeling of all current catalysts and emission mitigating components (DPF, CDPF, SCR, LNT, DOC, AMOX, etc) as well as any new ones that are likely to be developed in the future
- Built-in direct and DOE optimizers for parameter identification
- Proprietary models can be encrypted by the user for distribution outside the organization to protect confidential data
- Detailed thermal modeling of solid temperature distribution is enabled using GT-SUITE thermal component library



## Advanced Features and Applications:

Capable of modeling:

- DOC
- LNT
- DPF
- SCR
- AMOX
- TWC

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

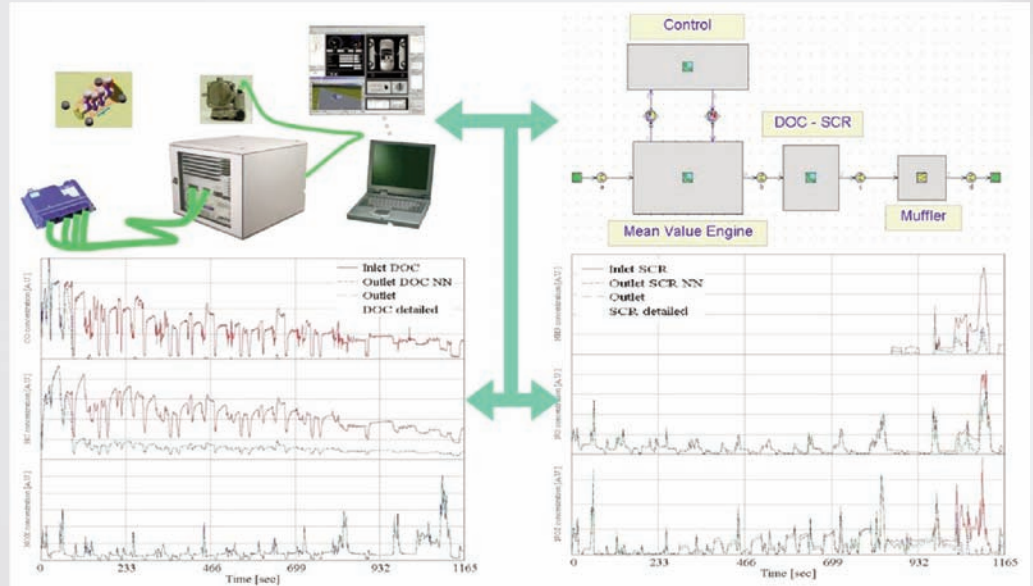
Virtual coupling with other sub-systems to achieve RT performance without sacrificing accuracy

Designed for use in reagent control and regeneration strategies

These capabilities are included in every GT-SUITE license

## Efficient Solvers Compatible with RT Simulation

- Can be used as a standalone AT modeling tool as well as a part of an integrated system comprising of engine, vehicle and control sub-systems
- Relative positions and ordering of multiple AT components can be studied
- Varieties of solvers are provided for handling stiff DAE systems. The solution can utilize any of GTI's explicit, implicit, or quasi-steady numerical solvers to allow the user to make the choice between level of details vs. simulation runtime
- Complex integrated model can be virtually sectioned into separate circuits in order to achieve RT performance without sacrificing accuracy and coupling between the sub-systems
- Using built-in tools, AT models can be transformed into NN models to achieve high computational speed for RT applications
- Fast and efficient. The Quasi-steady (Q-S) solver is compatible with RT model requirement for standalone AT system simulation



- Quasi 2-D/3-D flow/heat transfer modeling to simulate multi-D behavior of AT components

