gPROMS

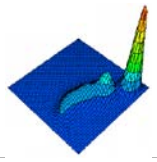
Mathematical modelling power for Engineers and Scientists

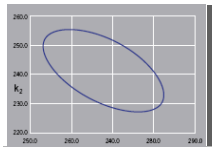
PSE's gPROMS was developed originally at Imperial College London for solving large and complex process systems using *first-principles models of system physics and chemistry*.

However gPROMS has evolved to be much more than just a process modelling tool. It can be used to solve large sets of differential and algebraic equations in many different contexts.

Do you need to:

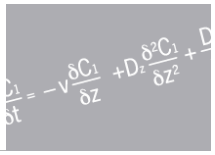
... solve large-scale equation systems?

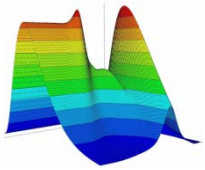




... estimate parameters from experimental data?

... work with ODE and partial differential systems?





... concentrate on physics, avoid programming?

The gPROMS advantage

gPROMS has a number of key advantages as a modelling environment for scientific research. Here are just some:

"Multiple applications: simulation, optimisation, parameter estimation"

"gPROMS physics and chemistry models link to CFD in six different ways"

- gPROMS is an **equation-oriented**, **simultaneous solution** environment. No **programming is required**: users enter first-principles relationships as equations. gPROMS takes care of the solution automatically.
- The powerful modelling language caters for **lumped and distributed systems** (size, spatial, residence time). gPROMS can solve systems involving 1m+ equations.
- The same model can be used for **multiple applications**: simulation, optimisation parameter estimation, in steady-state or dynamic (transient) mode.
- Powerful **model-based data analysis tools** allow model parameters to be estimated from experimental data, and provide information for quantitative risk management.
- **Model-based experiment design** techniques can be used to minimise experiment time and cost while maximising information from each experiment.
- Comprehensive **QA facilities** ensue that the all-critical numbers used in design and optimisation are auditable at any time.
- gPROMS physics and chemistry models **can link to CFD** hydrodynamic models in six different ways.

PSE

www.psenterprise.com

Project environment

- Easy creation of custom models and own connection types
- Easily-maintainable corporate model libraries
- Equipment palettes for quick access to library models

Multiple activities using same model: simulation, parameter estimation, optimisation and experiment design

- Easy incorporation of laboratory and pilot data into first-principles models
- Drag-and-drop flowsheeting
- Auto-complete and syntax checking

Comprehensive results management facilities

- Comprehensive Quality Assurance tools for reliable, auditable data
- Open architecture – easy links to external software

Interchangeable graphic and gPROMS language views maintained fully consistent at all times

Export models

Execution in external software environments on behind Excel or VB interface

Powerful modelling language

- Lumped and distributed systems
- Flexible case and conditional structures
- Full array handling with parameter propagation
- Easy calls to external software (e.g. physprops)
- Integro-Partial Differential Algebraic Equation (IPDAE) formulation for complete modelling power
- Modelling of large-scale systems (1m+ equations)
- Easily maintainable and auditable

Links to CFD

Six different ways to link CFD and gPROMS models

Advanced model libraries

For fixed-bed catalytic reaction, solution crystallisation, gas-liquid contacting and fuel cells