LOGE

LOGEapi

Our state-of-the-art collection of chemistry solver APIs to boost prediction and computational performance of your 3rd party Computational Fluid Dynamics (CFD) solver.

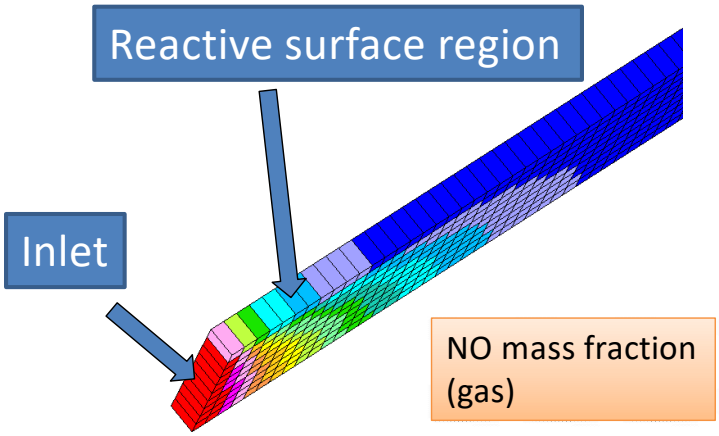
Our high-performance solver technology APIs can be coupled with third party computational fluid dynamics solvers that provide user coding functionality. The LOGEapi package provides combustion models which offer faster computational time and higher precision than those used in traditional CFD combustion analysis. The higher precision is achieved by the use of detailed chemistry. Direct chemistry solutions as well as tabulated chemistry solutions are featured.

LOGEapi contains combustion model interfaces for:

- Well-stirred reactor (WSR) API with load balancing and cell clustering technology
- Combustion progress variable (CPV) API which is a tabulated chemistry based WSR.
- Interactive Flamelet API with Transient Interactive Flamelet (TIF) and Dominant Interactive Flamelet (DIF).
- API for Conditional Moment Closure (CMC) with tabulated chemistry, a unique method which can be used for computing cell-local resolved CMC of the whole engine cylinder.

Advanced soot emission modelling capabilities

- Transport mean values of the soot moments or sections cell by cell (Standard approach)
  ≫ Chemical sources from flamelet library or online calculation if a species transport model is used.



NO mass fraction (gas) in catalyst channel.

- Source terms with presumed moment shape (FSM, semi-detailed approach)
  ≫ A shape of soot moments in mixture fraction space assumed for the source term evaluation.
  ≫ Chemical sources using flamelet library
  ≫ Can be extended to account for species shapes if a species transport model is used.
- CMC for soot moments (Detailed approach)
  ≫ Transport equations for soot moments conditioned on mixture fraction are solved on-line for each cell in the CFD domain.
  ≫ Chemical sources using flamelet library.

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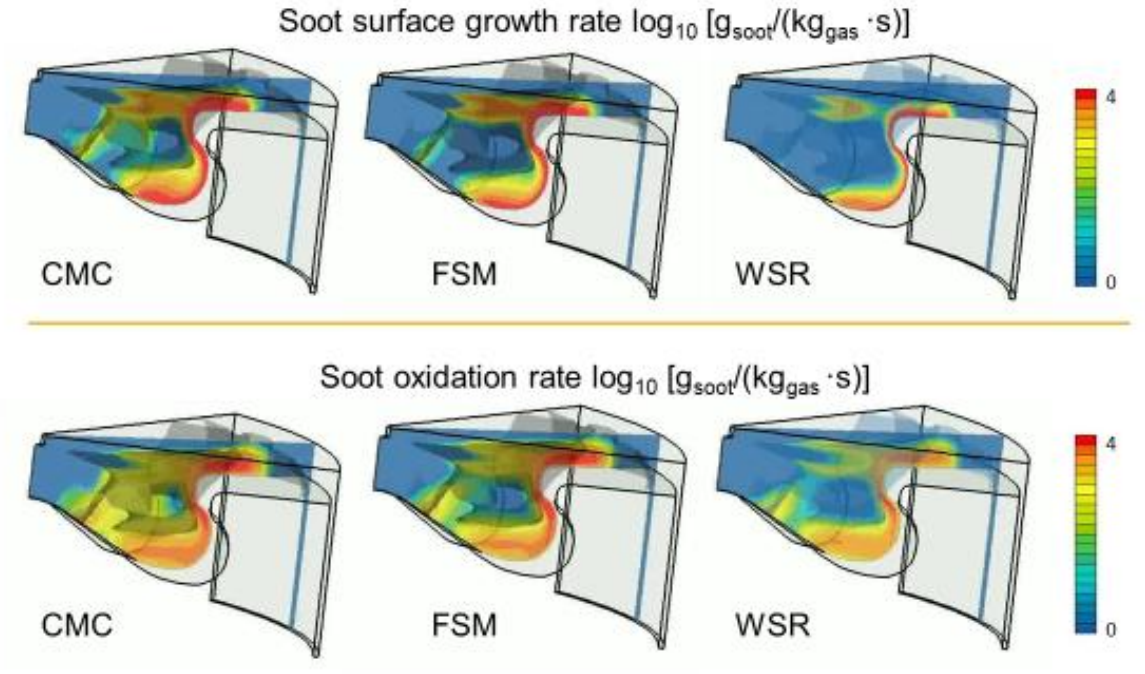


CFD consultancy

Dedicated advanced combustion model development and implementation.

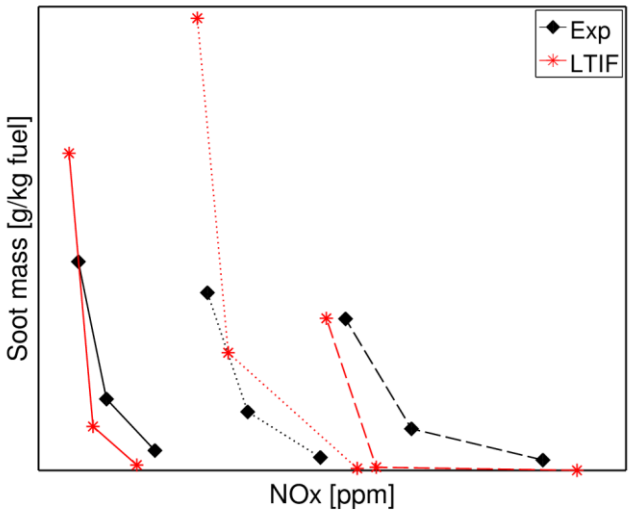
- Species-transport based models
- Interactive flamelet
- Conditional moment closure
- Dual fuel modelling

Emission modelling.

- Soot: detailed kinetic soot model coupled with advanced modelling of the soot particle size distribution function through the method of moments or the sectional method.
- NOx and Unburned hydrocarbons (library or online chemistry based) .

Tabulated chemistry.

- Combustion and laminar flame speed table generation for ECFM-3Z based models (TKI, CLE-H) and level-set (G-equation) models.
- Soot, NOx, UHC, CO flamelet libraries.
- Transient flamelet libraries.



Soot-NOx predictions for a Diesel engine sector case using LOGEapi (TIF-DIF) model in RANS-CFD.

Recent publications

Lehtiniemi, H. et al. "*Combustion Modeling of Diesel Sprays*", SAE Technical Paper 2016-01-0592, 2016, doi:10.4271/2016-01-0592.

Netzer, C. et al., "*3D Engine knock prediction and evaluation based on detonation theory*", Converge User Meeting 2016

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