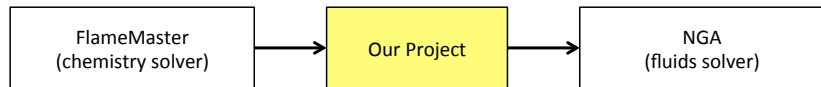


Tabulation of Chemical Source Terms for Turbulent Combustion Simulations

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Introduction



Key Capabilities:

- ▶ Sorting
- ▶ Monotonicity checking
- ▶ Convolution
- ▶ Interpolation

SWIG will be used to interface C++ and Python.

Git will be used for version control.

DOxygen will be used for documentation.

Progress Variable

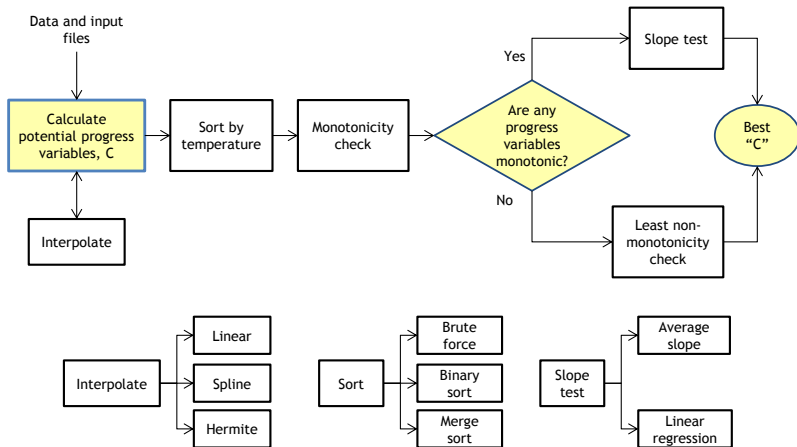
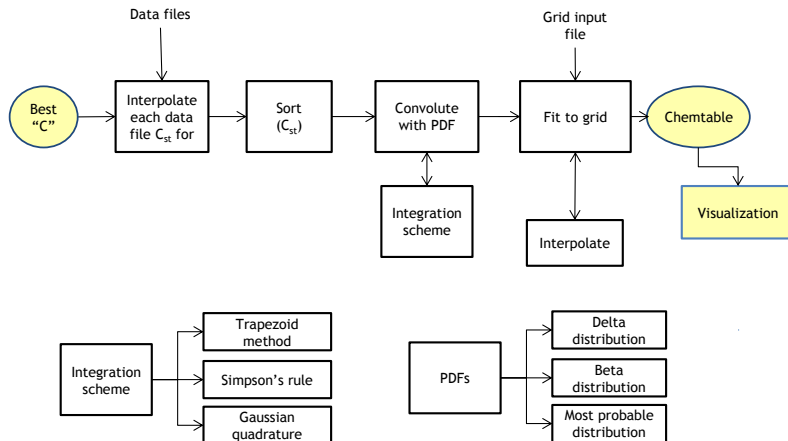


Table Generation



Python: User Interface

Modules: Sorting

Modules: Interpolate

Modules: MonoCheck

Modules: MaxSlope/LeastNonMono

Modules: PDF

PDF.h/.i

- ▶ deltaPDF.h/.cc
- ▶ betaPDF.h/.cc

Constructors:

- ▶ DeltaPDF(const double *Mean)
- ▶ BetaPDF(const double *Mean, const double *Variance)

Virtual Functions:

- ▶ int valPDF(const double *Z, const int ZPoints, Matrix3D *pdfValues)

Tests:

- ▶ Delta PDF: various means
- ▶ Beta PDF: zero variance (Delta PDF), symmetric/skewed distributions, infinite boundaries

Modules: Integrator

Integrator.h/.i

- ▶ Trapz.h/.cc
- ▶ Simpson.h/.cc
- ▶ GLQuad.h/.cc

Constructors

- ▶ Trapz()
- ▶ Simpson()
- ▶ GLQuad(int Nodes)

Virtual Functions:

- ▶ double integrate(const double *integrand, const double *Z, const int ZPoints)

Tests:

- ▶ Various functions

Modules: Convolute

Convolute.h/.i

- ▶ Convolute.h/.cc

Functions:

- ▶ `int convVal(double *Z, double *data, Matrix3D *pdfValues, Matrix *return, Integrator *intgr)`

Tests:

- ▶ Convolute with 1 using all PDFs/Integrators

Modules: FitToGrid

Profiling