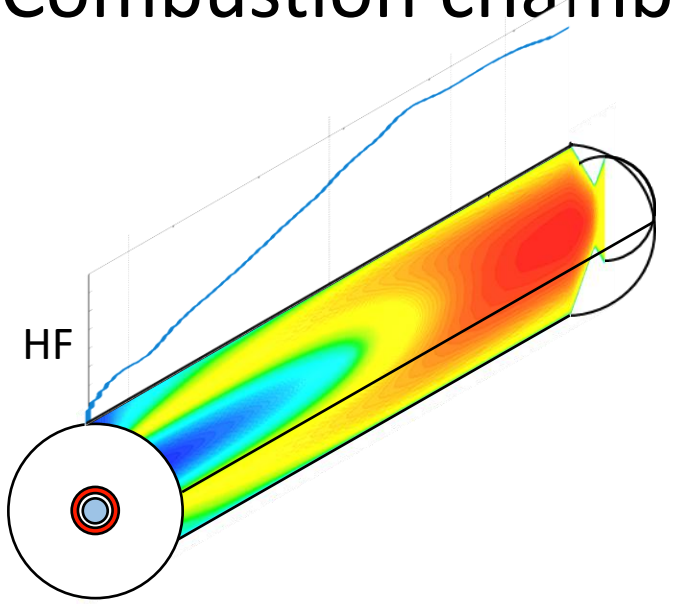
CFD of Combustion Chambers

Project description:
Cases, Parameter variations, Analysis

Cases and Validation

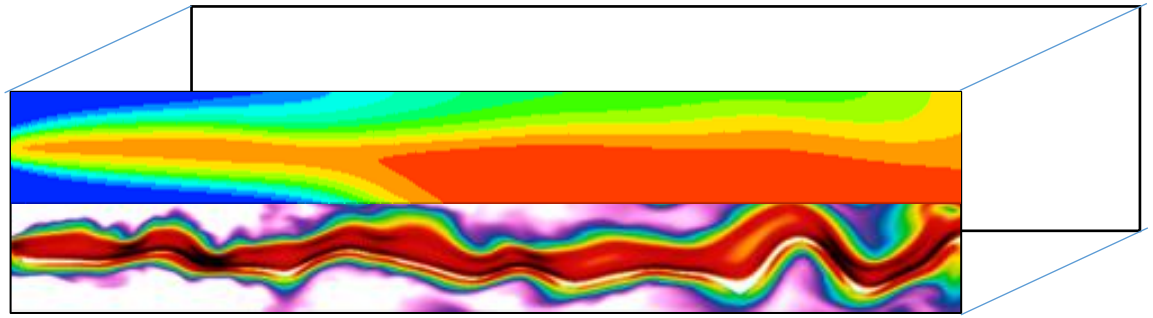
Combustion chamber (CC)



Validation of RANS with
experimental measurements

Anchored Flame (AF)

DNS domain



Validation of RANS with
DNS data

CC-1-round
(GOX)

Varied parameter

- Viscous heating
- Compressibility effects
- Thermal diffusion
- Diffusion energy source
- Combustion chamber and DNS domain
- k-e (wall function) vs. k-omega SST vs. RSM

Study strategy

- Read our papers

  to understand the DNS methods and how to use validation/analysis techniques.
- Read Ansys fluent theory guide

  to understand the RANS implementation of the varied parameters.
- Read Experiment papers to understand the measurement technique

Each source will be uploaded or shared.

Analysis strategy

- Unmixedness
- Reynolds averaged field
- Favre averaged field
- Statistical analysis
- Machine learning data analysis
- Species analysis at outlets/boundary layers/…
- Determine relations between chemistry and turbulence
- …

Data format

- RANS:
  - csv in ascii
  - fluent .dat file
- DNS:
  - scv in ascii
  - matlab table
- Exp. Measurements:
  - list in ascii
  - fluent profile