0D/1D combustion modeling

- SI-SRM (Emissions)
- CFM1D (Heat release)
- ODE with detailed chemistry
- Engine map simulations to predict emissions
- Mixing Time Mapping
- Turbulence look-up tables
- Coherent Flame Model

Reduction methodology development

- Modelling workflow to address combustion analysis from a local (in-cylinder) perspective to a system approach (in-vehicle)

0D/1D fast simulations

vGPS Concept (virtual soot sensor)

- Model inputs (from ECU)
- Modified Masses-Kattle / Platen sooty spray model
- Impingement model
- Wall ERE evaporation model
- Soot model

Calibration

- 1-cylinder
- Multi cylinder from demo vehicle

vGPS integration into Simcenter Amesim

- RDE cycle real time ratio ~50
- Check the live demo!

Validation of tool couplings with SI-SRM and vGPS for emissions predictions
- With crank-angle based combustion model
- With a MVEM approach

With crank-angle based model
- Outputs of A based model
- Processing of emissions into a MVEM
- MVEM ready to use

With MVEM based model
- Efficiency processing via a MVEM
- MVEM ready to use

Doe
- DOE

Doe
- Multi cylinder from demo vehicle

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