An Integrated Platform for Engine Performance Simulations and Optimization under Diesel Conditions

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Poster Location P-17
Integrated Engine Test Platform – Project Overview

Integrated Approach Concept

- **Chemistry**
- **Physics**
- **Optimization**

**Fuel model**
Chemical Reaction Mechanisms

**DI-SRM Engine**
Direct Injection Stochastic Reactor Model

**DI-SRM Engine**

**DI-SRM for Diesel engine simulations**
**Engine performance and emissions**
**Detailed chemistry but still low CPU (up to < 5sec per engine cycle)**
**Fuel testing under Diesel conditions**
**Full cycle performance simulations**

**OPAL**
OPtimization ALgorithms \ Genetic Algorithms

Detailed chemistry but still low CPU (up to < 5sec per engine cycle)

**Overall Simulation Method**

- **Fuel model & DI-SRM**
  - Baseline Model
  - Verification
  - Optimizer
    - Self-Calibration
  - DI-SRM Engine
    - Applications
  - Optimizer
    - Model Training

**Engine – Fuel Interaction optimization under Diesel conditions**
**Best output performance**
**Low engine-out emissions**

**Engine – Fuel Interaction optimization under Diesel conditions**

**Initial Temperature (K)**

<table>
<thead>
<tr>
<th>Initial Pressure (bar)</th>
<th>1.45</th>
<th>1.55</th>
<th>1.65</th>
<th>1.75</th>
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<td>Initial Temperature (K)</td>
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