## Study and control of parietal heat exchanges in thermal engines

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### Objectives
- Increase the efficiency and optimize the operating conditions of thermal engines (ICE and hot air engine)
- Develop a test bench for transient measurements of temperatures
- Determine a correlation to deduce the convection heat transfer coefficient

### Methodology

#### Draft of the experimental set up

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Temperature</th>
<th>Fluid</th>
<th>Pressure</th>
<th>Average Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Combustion Engine</td>
<td>0-50Hz</td>
<td>0-200°C</td>
<td>Air</td>
<td>0-2 Bar</td>
</tr>
<tr>
<td>Hot Air Engine</td>
<td>0-30Hz</td>
<td>0-700°C</td>
<td>Air</td>
<td>0-7 Bar</td>
</tr>
</tbody>
</table>

#### First Results

**Testing**
- Measurements by infrared thermography on an intercooler of ICE in a test bench for different engine operating points

**Modelling**
- Computer Aided Design of the intercooler for CFD modelling

#### Future Work
- Develop a detailed post-processing for the infrared thermography
- Set up the experimental test bench for the hot air engine
- Develop the CFD model to compare modeling results with experimental data