Comparison between full and reduced CaltechMech 2.1 on a laminar iso-octane/air premixed flame

1 Flame structure

Figure 1: Structure of a one-dimensional, unstretched laminar premixed iso-octane/air flame with $\phi = 0.9$, $P_0 = 1$ bar and $T_u = 298$ K. The solutions using the full CaltechMech 2.1 (171 species and 1835 reactions) and its reduced version (74 species and 976 reactions, no soot and linear alkane decomposition pathways) are compared. Both simulations are performed with FlameMaster.

2 Laminar flame speed and flame thickness

<table>
<thead>
<tr>
<th></th>
<th>CaltechMech 2.1</th>
<th>reduced</th>
</tr>
</thead>
<tbody>
<tr>
<td>$S_L$ (m/s)</td>
<td>0.30</td>
<td>0.32</td>
</tr>
<tr>
<td>$l_F$ (mm)</td>
<td>0.41</td>
<td>0.40</td>
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</tbody>
</table>

Table 1: Laminar flame speed and laminar flame thickness obtained for the flames considered in Fig. 1.