INTRODUCTION:

• We study the water in oil droplets formation inside a 2D microfluidic flow focusing geometry.
• Generation of monodisperse droplets of two immiscible fluids

RESULTS:

• Material properties of oil and water were given as shown in table

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Dynamic Viscosity (Pa·s)</th>
<th>Density (kg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>1.05e-3</td>
<td>1000</td>
</tr>
<tr>
<td>Oil</td>
<td>6.71e-3</td>
<td>900</td>
</tr>
</tbody>
</table>

• First the disperse phase meets the continuous phase and forms a convex shape governed by the surface tension of the fluid.

• Lower water flow rate brings the droplet breakup close to the flow focusing region.
• Droplets starts aligning to the centre within a distance of 100 μm from the flow focussing point.
• Not much variation observed in this distance across different sample(water) flowrates.

CONCLUSIONS:

• Successfully simulated a micro fluidic droplet generator.
• Analysed the formation and evolution of the successive droplets.
• Understood the dependence of flow rate ratio of the two phases.
• Finally the droplets observed to be getting aligned to the centre of the fluidic channel within a distance of 100 μm.