



Accurate numerical simulation of contact lines

ECFD3 - 01/2020 - Autrans

Savinien Pertant



Modification in Ghost Fluid Method

• Pressure jump in the gas used for Poisson equation & Grad(P) :

$$[P]_i = \frac{\rho_l}{\rho^*} [P]_{\Gamma} + \left(1 - \frac{\rho_l}{\rho^*}\right) \left(P_{i+1}^l - P_i^g\right)$$

→ Mesh dependent expression



→ Modification tested : $\rho^* = (\rho_q + \rho_1)/2 \rightarrow \text{not mesh dependent}$



YALES2



Modification in Ghost Fluid Method



Contact line close to node in liquid

- Pressure gradient divided by 10 with new method !
 To be tested & understood deeper...

YALES2



Mesh adaptation

• First test : AVVT/sps_2D_AMR_droplet_convection



 Droplet deformation while no deformation without AMR → shouldn't happen because no adaptation around interface

Y A L E S 2

• Singular nodes (4 neighbours) close to interface



Mesh adaptation



• No angle imposed



- Method to be coupled with contact angle imposition & high order operators for curvature computation (in progress but still bugs)
- Will enable accurate curvature close to the wall

 $Y \land L \equiv S \supseteq$



Perspectives



- Perform mesh adaptation on 3D contact line cases
- Modify CLS reinit on wall to be conservative
- Mesh independent method to impose pressure jump ?