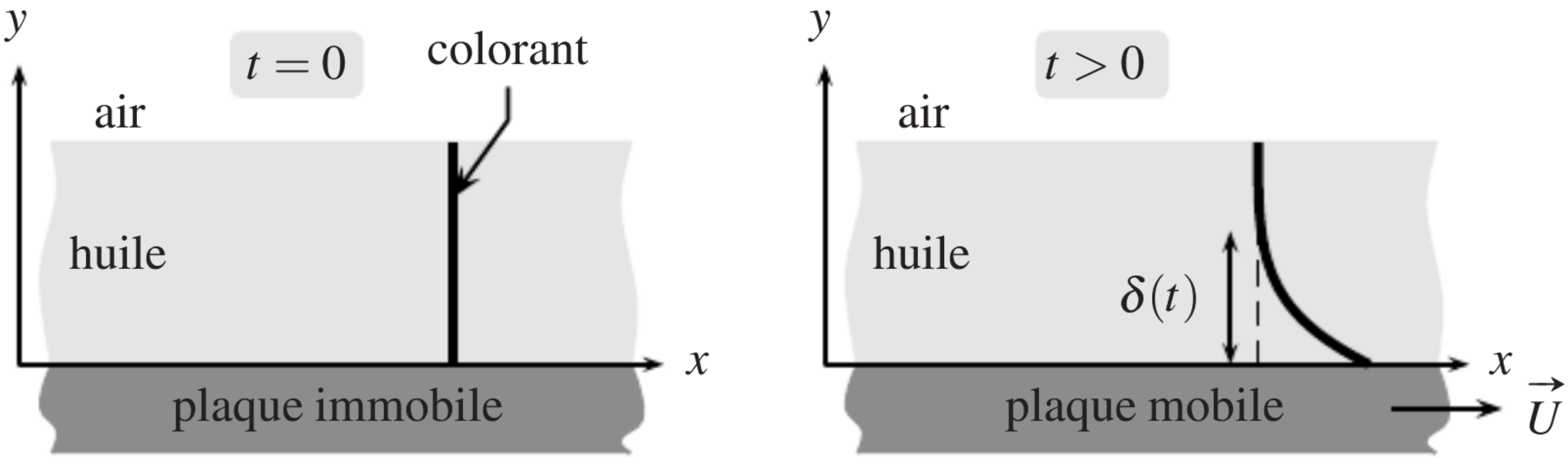
Notion de viscosité d’un fluide
Ecoulement visqueux

Existence de contraintes tangentielles dans un fluide



Sanz, 2016

Conditions aux limites

Interface	Vitesse	Pression	Contrainte tangentielle
Paroi solide	$\vec{v}_{\text{fluide}} = \vec{v}_{\text{paroi}}$	$p_{\text{fluide}} = p_{\text{paroi}}$	$\eta\left(\frac{\partial v_x}{\partial z}\right) = \sigma_{\text{paroi}}$
Fluides	$\vec{v}_{\text{fluide1}} = \vec{v}_{\text{fluide2}}$	$p_{\text{fluide1}} = p_{\text{fluide2}}$	$\eta_1\left(\frac{\partial v_x}{\partial z}\right)_{\text{fluide1}} = \eta_2\left(\frac{\partial v_x}{\partial z}\right)_{\text{fluide2}}$

Operateur v.gradient en coordonnées cylindriques

$\overrightarrow{\boldsymbol{e_r}}$ $\quad V_r \frac{\partial V_r}{\partial r} + \frac{V_\phi}{r} \frac{\partial V_r}{\partial \phi} + V_z \frac{\partial V_r}{\partial z} - \frac{V_\phi^2}{r}$

$\overrightarrow{\boldsymbol{e}_\theta}$ $\quad V_r \frac{\partial V_\phi}{\partial r} + \frac{V_\phi}{r} \frac{\partial V_\phi}{\partial \phi} + V_z \frac{\partial V_\phi}{\partial z} + \frac{V_r V_\phi}{r}$

$\overrightarrow{\boldsymbol{e_z}}$ $\quad V_r \frac{\partial V_z}{\partial r} + \frac{V_\phi}{r} \frac{\partial V_z}{\partial \phi} + V_z \frac{\partial V_z}{\partial z}$