

What are the correct boundary conditions at the interface?

a) $\underline{u} = \underline{0}$, $\phi = \phi_{\text{air}}$

b) $\frac{d}{dt}(z - h(x, y, t)) = 0$, $\phi = \phi_{\text{air}}$

c) $\underline{u} = \underline{0}$, $\underline{\tau} = \underline{T} \cdot \underline{n} = -\phi_{\text{air}} \underline{n}$

d) $\frac{d}{dt}(z - h(x, y, t)) = 0$,

$$\underline{\tau} = \underline{T} \cdot \underline{n} = -\phi_{\text{air}} \underline{n}$$

The reduced form of the z-momentum equation

$$0 = - \frac{\partial p}{\partial z} + \mu \left[\frac{1}{r} \frac{\partial}{\partial r} \left(r \frac{\partial w}{\partial r} \right) + \frac{\partial^2 w}{\partial z^2} \right] - \rho g$$

$\sim \frac{\rho}{H}$
 $\sim \mu \frac{w}{L^2}$
 $\sim \mu \frac{w}{H^2}$
 $\sim \rho g$

is

a) $0 = - \frac{\partial p}{\partial z} + \mu \frac{\partial^2 w}{\partial z^2} - \rho g$

b) $0 = - \frac{\partial p}{\partial z} - \rho g$

c) $0 = - \frac{\partial p}{\partial z}$