



*governing equation in upper layer*  $C_{w,s}^2 \nabla^2 \phi_w - \frac{\partial^2 \phi_w}{\partial t^2} = 0, \quad -h_p \leq z \leq 0$

*governing equation in down layer*  $C_{p,s}^2 \nabla^2 \phi_p + 2\nu_s \frac{\partial}{\partial t} \nabla^2 \phi_p - \frac{\partial^2 \phi_p}{\partial t^2} = 0, \quad -h \leq z \leq -h_p$

$$C_{w,s} = 1500 \text{ m/s}$$

$$C_{p,s} = 2000 \text{ m/s}$$

$$g = 9.81$$

$$\phi_w = u_2 \text{ (comsol)}$$

$$\phi_p = u_1 \text{ (comsol)}$$

$$\nu_s = 2 * 10^{10}$$