



$$\Omega_i = [-w_x, w_x] \times [-w_y, w_y] \times [0, H]$$

$$\Omega_o = [-W_x, W_x] \times [-W_y, W_y] \times [0, H]$$

$$u_i = \left(\frac{z}{H}\right)^2 \sin\left(\frac{\pi}{H}z\right) \sin\left(\frac{\pi}{w_x}x\right) \sin\left(\frac{\pi}{w_y}y\right)$$

$$u_o = u_i + \cos(\pi(x - w_x)(x + w_x)) \cos(\pi(y - w_y)(y + w_y))$$

The solution satisfies the following:

$$\begin{aligned} u_o - u_i &\neq 0 \\ \nabla u_i \cdot n_i|_{\Gamma} + \nabla u_o \cdot n_o|_{\Gamma} &= 0 \\ \nabla u_i \cdot n_i|_{\Gamma} &\neq 0 \end{aligned}$$