A PDE equation:

$$K\left(\frac{\partial^2\theta}{\partial x^2}+\frac{\partial^2\theta}{\partial y^2}\right)-\gamma\frac{\partial\theta}{\partial t}+\frac{\partial v}{\partial y}\left(\alpha_3\sin^2\theta-\alpha_2\cos^2\theta\right)+\varepsilon_0\varepsilon_a E^2\sin\theta\cos\theta+F\times\hat{n}=0$$

K : elastic constant (We assume the liquid crystal material is isotropic.)

$\gamma=\alpha_3-\alpha_2$: viscosity constant

$\frac{\partial v}{\partial y}$: shear velocity (Fluid dynamics)

ε_0 : permittivity of free space

ε_a : dielectric anisotropic

E : electric field

F : external force

$\hat{n}$: a unit length

The description of condition:

I design a liquid crystal material fixed in 25 mm*22 mm*8μm (length*width*height)

Only upward face is free, the others included faces and sides are fixed.

The upward face will be given a external force on arbitrary position.