

These are some of the doubts that i've had while deriving the equations. While we derived the stress balance equation at the liquid -gas interface, we did the following,

1.

$$(1) \quad \left[(-p + 2\mu \frac{\partial u_r}{\partial r}) + \mu \left(\frac{1}{r} \frac{\partial u_r}{\partial \theta} - \frac{u_\theta}{r} + \frac{\partial u_\theta}{\partial r} \right) \left(\frac{-1}{r} \frac{\partial h}{\partial \theta} \right) + \mu \left(\frac{\partial u_z}{\partial r} + \frac{\partial u_r}{\partial z} \right) \left(\frac{-\partial h}{\partial z} \right) \right]$$

$$\frac{1}{\left(\sqrt{\left(\frac{1}{r} \frac{\partial h}{\partial \theta} \right)^2 + 1} \right)} \frac{1}{\sqrt{\left(\frac{\partial h}{\partial z} \right)^2 + \left(\frac{1}{r} \frac{\partial h}{\partial \theta} \right)^2 + 1}}$$