



$$\rho Q_{net} \equiv \frac{\partial \rho q_p}{\partial t} + \nabla \cdot (\rho q_p \vec{u}) + \frac{\partial (\rho q_p w)}{\partial z} - \frac{\partial (\rho q_p V_t)}{\partial z}$$

$$Q_{net} > 0$$

Saturated

Release heating/cooling

$$\frac{D\theta}{Dt} \approx \frac{-L_c \theta}{C_p T} w \frac{\partial q_s}{\partial z}$$

$$Q_{net} \leq 0$$

Unsaturated

No heating/cooling

$$\frac{D\theta}{Dt} = 0$$