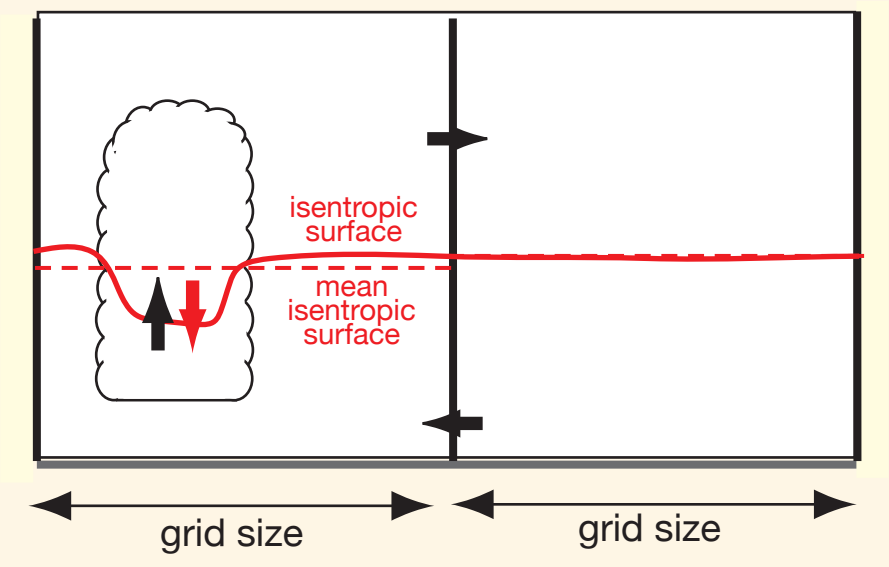
An alternate expression (elimination of PS) :

$$\left(\frac{\partial}{\partial t}\right)\left(\overline{\rho^*}\hat{\Psi}\right) = -\left[\overline{\nabla\cdot\left(\rho^*\mathbf{v}\Psi\right)} + \frac{\partial}{\partial\theta}\overline{\rho^*\dot{\theta}\Psi}\right] + \overline{\rho^* RS(\Psi)} \qquad \dot{\theta} = RS(\theta)$$

When $\Psi = \theta$,

$$\boxed{\left(\frac{\partial}{\partial t}\right)\overline{\rho^*} = -\overline{\nabla\cdot\left(\rho^*\mathbf{v}\right)} - \frac{\partial}{\partial\theta}\overline{\rho^*\dot{\theta}}}$$



$\dot{\theta}$ inside the cloud is recognized at a higher level.