$$\text{Required } PS(\overline{\Psi}) = \overline{RS(\Psi)} - \left[\overline{\nabla\cdot(\mathbf{v}\Psi)} - \nabla\cdot(\overline{\mathbf{v}}\,\overline{\Psi})\right] - \frac{\partial}{\rho\partial z}\rho\left[\overline{w\Psi} - \overline{w}\,\overline{\Psi}\right]$$

A SIMPLE MASS FLUX MODEL

Parameterized source of moist static energy :

$$PS(h) = D(hc - h) + M_c \frac{\partial \overline{h}}{\partial z}$$

M_c : Mass flux of compensating subsidence

D : mass detrainment

Real source matters only implicitly through D and M_c.

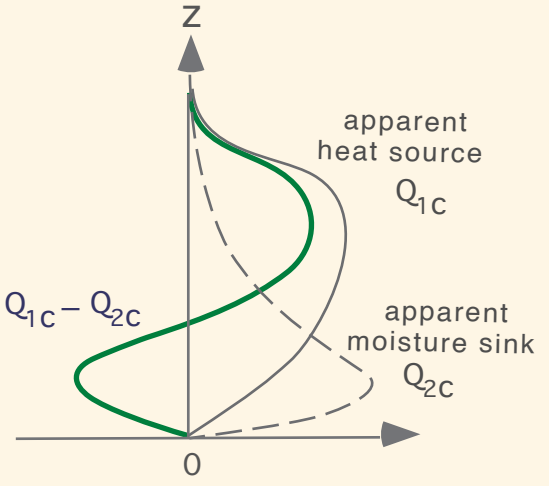
When $D = 0$,

$$PS(h) = M_c \frac{\partial \overline{h}}{\partial z}$$

In the tropics, typically

$\frac{\partial \overline{h}}{\partial z} < 0$ in the lower troposphere,

$\frac{\partial \overline{h}}{\partial z} > 0$ in the upper troposphere,

When a deep profile of M_c is used, this result qualitatively agrees with typical tropical profiles of $Q_{1c} - Q_{2c}$.

Required PS(h) as suggested by observed L-S budgets