

$$u = \langle u \rangle + u' = \bar{U} + u'$$

$\uparrow$  Zonal mean

$$\text{Shear: } - \langle u'w' \rangle \frac{\partial \bar{U}}{\partial z} - \langle v'w' \rangle \frac{\partial \bar{V}}{\partial z}$$

$$\text{Transport: } - \bar{V} \frac{\partial \langle E \rangle}{\partial y} - \bar{W} \frac{\partial \langle E \rangle}{\partial z} \quad \left[ E = \frac{1}{2} (u'^2 + v'^2 + w'^2) \right]$$

$$- \frac{\partial}{\partial y} \langle v'E \rangle - \frac{\partial}{\partial z} \langle w'E \rangle$$

$$\text{Buoyancy: } \langle b'w' \rangle \quad \left[ b' = \left( -\frac{g}{\rho_0} \right) \rho' \right]$$

$$\text{Pressure work: } -\frac{1}{\rho_0} \langle p'w' \rangle$$

$$\text{Subgrid: } \left\langle u' \left( \frac{\partial F_{13}}{\partial z} \right)' + v' \left( \frac{\partial F_{23}}{\partial z} \right)' \right\rangle$$

$$\left[ F_{13} = K_z \frac{\partial u}{\partial z}, \quad F_{23} = K_z \frac{\partial v}{\partial z} \right]$$