effective turbulent diffusivity

$\hat{x}$ – momentum: $$\frac{\partial \overline{\rho v_x}}{\partial t} + \frac{\partial \overline{\rho v_x v_z}}{\partial z} = 0$$

re-write as: $$\frac{\partial \overline{\rho v_x}}{\partial t} = -\frac{\partial \overline{\tau_{xz}}}{\partial z}$$

diffusion equation:

$$\frac{\partial \overline{\rho v_x}}{\partial t} = \frac{\partial}{\partial z} D_{turb} \frac{\partial \overline{\rho v_x}}{\partial z}$$

effective turbulent diffusivity:

$$D_{turb} = -\overline{\tau_{xz}} \Big/ \frac{\partial \overline{\rho v_x}}{\partial z}$$

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