$$
\begin{aligned}
c_p\Theta_0\left[\rho_0\frac{\partial^2\pi}{\partial x^2}+\frac{\partial}{\partial z}\left(\rho_0\frac{\partial\pi}{\partial z}\right)\right] &= \frac{g}{\Theta_0}\frac{\partial(\rho_0\theta)}{\partial z} \\
&\quad -\frac{\partial}{\partial x}\left[\rho_0\left(u\frac{\partial u}{\partial x}+w\frac{\partial u}{\partial z}-D(u)\right)\right] \\
&\quad -\frac{\partial}{\partial z}\left[\rho_0\left(u\frac{\partial w}{\partial x}+w\frac{\partial w}{\partial z}-D(w)\right)\right].
\end{aligned}
$$