Convection Diffusion Equation and Applications

$$\frac{\partial u}{\partial t} + U\frac{\partial u}{\partial x} = K\frac{\partial^2 u}{\partial x^2} + f$$

$u(x,t)$

$T(x,t)$

Heat transfer

$$\frac{\partial T}{\partial t} + U\cdot\frac{\partial T}{\partial x} = K\frac{\partial^2 T}{\partial x^2} + f$$

$C(x,t)$

Atmosphere transport

$$\frac{\partial C}{\partial t} + U\frac{\partial C}{\partial x} = K\frac{\partial^2 C}{\partial x^2} + f$$

$H(x,t)$

Reservoir engineering

$$\frac{\partial H}{\partial t} + U\frac{\partial H}{\partial x} = K\frac{\partial^2 H}{\partial x^2} + f$$