- **Zero Order Moments Equations**

$$
\begin{cases}
\dfrac{\partial n_{cc}}{\partial t} = \dfrac{1}{q}\dfrac{\partial J_{cc}}{\partial x} + i\dfrac{\hbar P}{2m}\dfrac{\partial}{\partial x}(n_{cv} - n_{vc}) + \dfrac{P}{q}(J_{cv} + J_{vc}) \\[2ex]
\dfrac{\partial n_{cv}}{\partial t} = \dfrac{1}{q}\dfrac{\partial J_{cv}}{\partial x} + \dfrac{i}{\hbar}[V_c(x,t) - V_v(x,t)]n_{cv} - i\dfrac{\hbar P}{2m}\dfrac{\partial}{\partial x}(n_{cc} + n_{vv}) + \dfrac{P}{q}(J_{cc} - J_{v} \\[2ex]
\dfrac{\partial n_{vv}}{\partial t} = \dfrac{1}{q}\dfrac{\partial J_{vv}}{\partial x} + i\dfrac{\hbar P}{2m}\dfrac{\partial}{\partial x}(n_{cv} - n_{vc}) - \dfrac{P}{q}(J_{cv} + J_{vc})
\end{cases}
$$

- **First Order Moments Equations**

$$
\begin{cases}
\dfrac{\partial J_{cc}}{\partial t} = \dfrac{2q}{m}\dfrac{\partial \mathcal{E}_{cc}}{\partial x} + \dfrac{q}{m}V_c^{'}(x,t)n_{cc} + i\dfrac{\hbar P}{2m}\dfrac{\partial}{\partial x}(J_{cv} - J_{vc} + \dfrac{2qP}{m}(\mathcal{E}_{cv} + \mathcal{E}_{vc}) \\
\dfrac{\partial J_{cv}}{\partial t} = \dfrac{2q}{m}\dfrac{\partial \mathcal{E}_{cv}}{\partial x} + \dfrac{q}{2m}[V_c^{'}(x,t) + V_v^{'}(x,t)]n_{cv} \\
\qquad + i\dfrac{1}{\hbar}[V_c(x,t) - V_v(x,t)]J_{cv} - i\dfrac{\hbar P}{2m}\dfrac{\partial}{\partial x}(J_{cc} + J_{vv}) - i\dfrac{2qP}{m}(\mathcal{E}_{cc} - \mathcal{E}_{vv}) \\
\dfrac{\partial J_{vv}}{\partial t} = \dfrac{2q}{m}\dfrac{\partial \mathcal{E}_{vv}}{\partial x} + \dfrac{q}{m}V_v^{'}(x,t)n_{vv} + i\dfrac{\hbar P}{2m}\dfrac{\partial}{\partial x}(J_{cv} - J_{vc}) - \dfrac{2qP}{m}(\mathcal{E}_{cv} + \mathcal{E}_{vc})
\end{cases}
$$

- **Second Order Moments Equations**

$$\frac{\partial \mathcal{E}_{cc}}{\partial t} = -\frac{m}{2}\frac{\partial M^{(3)}_{cc}}{\partial x} + \frac{1}{q}V_c^{'}(x,t)J_{cc} + i\frac{\hbar P}{2m}\frac{\partial}{\partial x}(\mathcal{E}_{cv} - \mathcal{E}_{vc}) - \frac{mP}{2}[M^{(3)}_{vc} + M^{(3}_{cv}$$

$$\frac{\partial \mathcal{E}_{cv}}{\partial t} = -\frac{m}{2}\frac{\partial M^{(3)}_{cv}}{\partial x} + i\frac{\hbar}{8m}[V_v^{''}(x,t) - V_c^{''}(x,t)]n_{cv} + \frac{1}{2q}[V_v^{'}(x,t) - V_c^{'}(x,t)]$$

$$- i\frac{1}{\hbar}[V_v(x,t) + V_c(x,t)]\mathcal{E}_{cv} - i\frac{\hbar P}{2m}\frac{\partial}{\partial x}(\mathcal{E}_{vv} + \mathcal{E}_{cc}) - i\frac{mP}{2}(M^{(3)}_{vv} - M^{(3}_{cc}$$

$$\frac{\partial \mathcal{E}_{vv}}{\partial t} = \frac{m}{2}\frac{\partial M^{(3)}_{vv}}{\partial x} - \frac{1}{q}V_v^{'}(x,t)J_{vv} - i\frac{\hbar P}{2m}\frac{\partial}{\partial x}(\mathcal{E}_{cv} - \mathcal{E}_{vc}) - \frac{mP}{2}[M^{(3)}_{cv} + M^{(3}_{vc}$$