

$$\begin{aligned}
\int \mathrm{d}^3\mathbf{N} \mathbf{N} \frac{\partial}{\partial t} (f(\mathbf{N}, t)) &= \int \mathrm{d}^3\mathbf{N} \mathbf{N} \left\{ -\frac{\partial}{\partial \mathbf{N}} \left\{ \gamma (\mathbf{N} \times \mathbf{H}) - \gamma \lambda (\mathbf{N} \times [\mathbf{N} \times \mathbf{H}]) + \frac{\gamma \lambda k_B T}{\mu_0} \left(\mathbf{N} \times \left[\mathbf{N} \times \frac{\partial}{\partial \mathbf{N}} \right] \right) \right\} f \right\} \\
&= -\gamma \int \mathrm{d}^3\mathbf{N} \mathbf{N} \frac{\partial}{\partial \mathbf{N}} (\mathbf{N} \times \mathbf{H}) f - \gamma \lambda \int \mathrm{d}^3\mathbf{N} \mathbf{N} \frac{\partial}{\partial \mathbf{N}} (\mathbf{N} \times [\mathbf{N} \times \mathbf{H}]) f + \frac{\gamma \lambda k_B T}{\mu_0} \int \mathrm{d}^3\mathbf{N} \mathbf{N} \frac{\partial}{\partial \mathbf{N}} \left(\mathbf{N} \times \left[\mathbf{N} \times \frac{\partial}{\partial \mathbf{N}} \right] \right) f \\
&= -\gamma \int \mathrm{d}^3\mathbf{N} (\mathbf{N} \times \mathbf{H}) f - \gamma \lambda \int \mathrm{d}^3\mathbf{N} (\mathbf{N} \times [\mathbf{N} \times \mathbf{H}]) f + \frac{\gamma \lambda k_B T}{\mu_0} \int \mathrm{d}^3\mathbf{N} \left(\mathbf{N} \times \left[\mathbf{N} \times \frac{\partial}{\partial \mathbf{N}} \right] \right) f
\end{aligned}$$