

New Grammar for Real Scalar Field

System:

$$\mathcal{L} = \partial_{\mu} \phi(x,t) \cdot \partial^{\mu} \phi(x,t) - V(\phi(x,t))$$

$$H(t) = \int d^3x \{ [\pi(x,t)]^2 + \partial_{\mathbf{k}} \phi(x,t) \cdot \partial_{\mathbf{k}} \phi(x,t) + V(\phi(x,t)) \}$$

Coordinate:

$$\Phi: \{ \phi : \mathbb{R}^4 \longrightarrow \mathbb{R} \} \longrightarrow \mathbb{C}$$

Equation:

$$i \frac{\hbar}{\alpha} \lim_{\varepsilon \rightarrow 0} \frac{\Phi[\phi(\square, \square, \square, \square - \varepsilon)] - \Phi[\phi]}{\varepsilon}$$

$$= \int d^4x \left\{ \left[-i \frac{\hbar}{\alpha} \frac{\delta}{\delta \phi(x)} \right]^2 + \partial_{\mathbf{k}} \phi(x) \cdot \partial_{\mathbf{k}} \phi(x) + V(\phi(x)) \right\} \Phi[\phi]$$