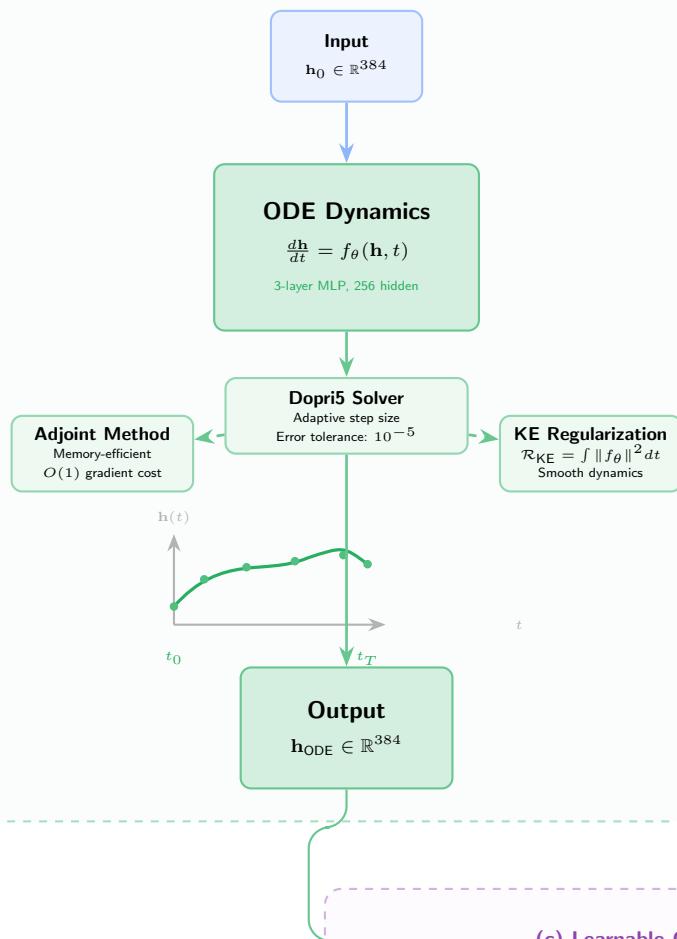
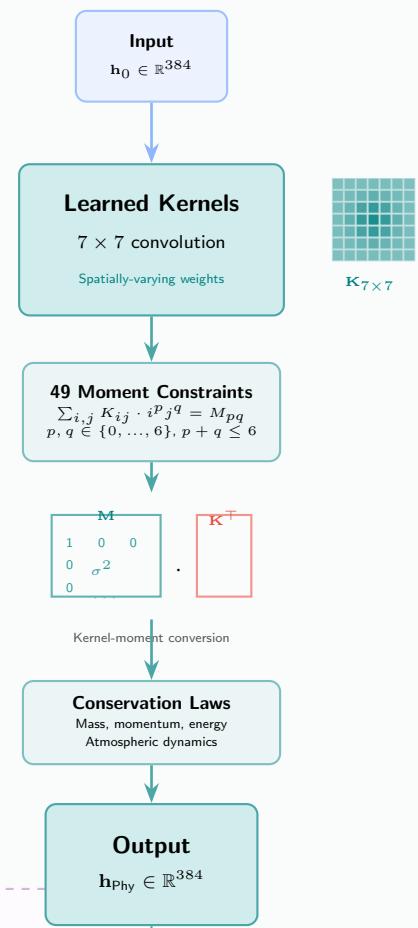
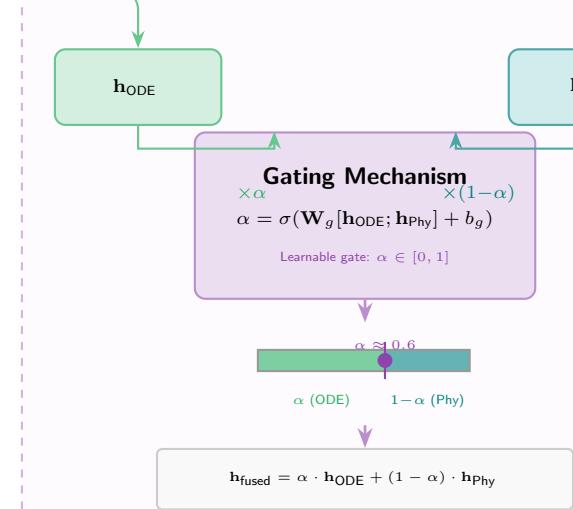


(a) Neural ODE Branch**(b) PhyCell Branch****(c) Learnable Gated Fusion****Key Equations:**

$$\text{Neural ODE: } \mathbf{h}(t_T) = \mathbf{h}(t_0) + \int_{t_0}^{t_T} f_{\theta}(\mathbf{h}(t), t) dt$$

$$\text{PhyCell: } \mathbf{h}_{Phy} = \text{PhyCell}(\mathbf{h}_0; \mathbf{K}, \mathbf{M}) \text{ with } \mathbf{K} = \mathbf{M}^{-1} \cdot \mathbf{C}$$

$$\text{Fusion: } \mathbf{h} = \sigma(\mathbf{W}_g \mathbf{h}_{cat}) \odot \mathbf{h}_{ODE} + (1 - \sigma(\mathbf{W}_g \mathbf{h}_{cat})) \odot \mathbf{h}_{Phy}$$