Universal Differential Equation (UDE)

$$dx_1/dt = \eta_{in} \cdot u^+ \cdot d - \eta_{out} \cdot u^- \cdot x_1 \qquad dx_2/dt = \alpha \cdot x_1 - f\theta(P_{gen})$$

Legend: Physics Parameters (η_{in}, η_{out}, α, β, γ)
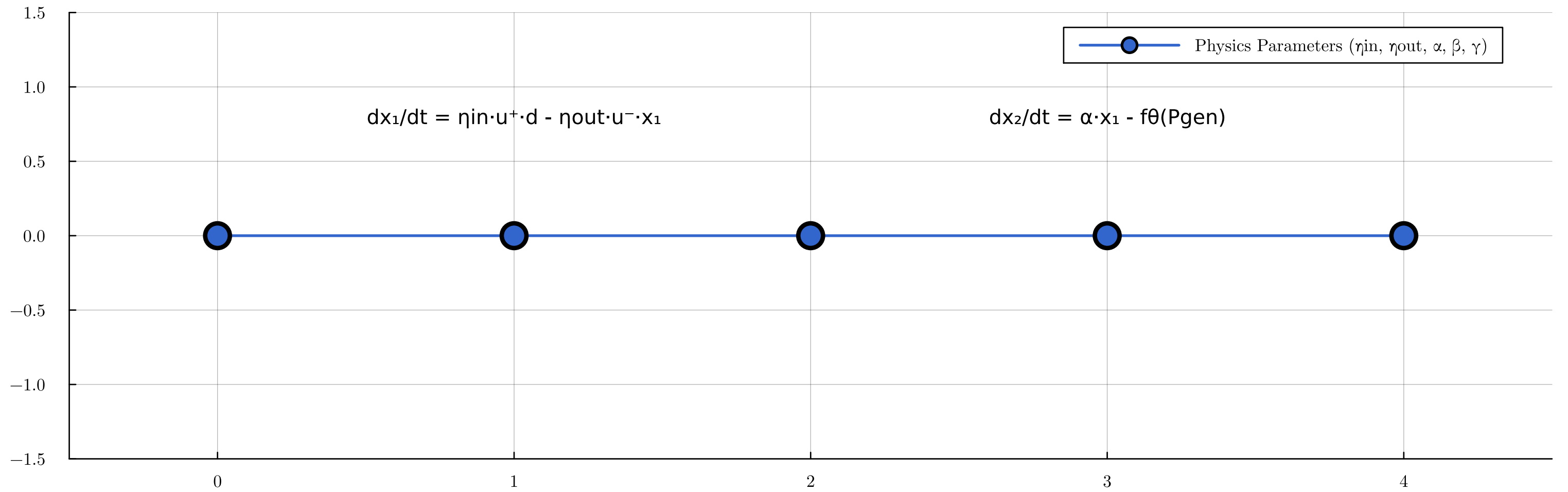
Bayesian Neural ODE (BNode)

$$dx_1/dt = f\theta_1(x_1, x_2, u, P_{gen}, P_{load}) \qquad dx_2/dt = f\theta_2(x_1, x_2, u, P_{gen}, P_{load})$$

$$\theta \sim N(\mu_0, \sigma_0^2)$$

Legend: Neural Parameters ϑ