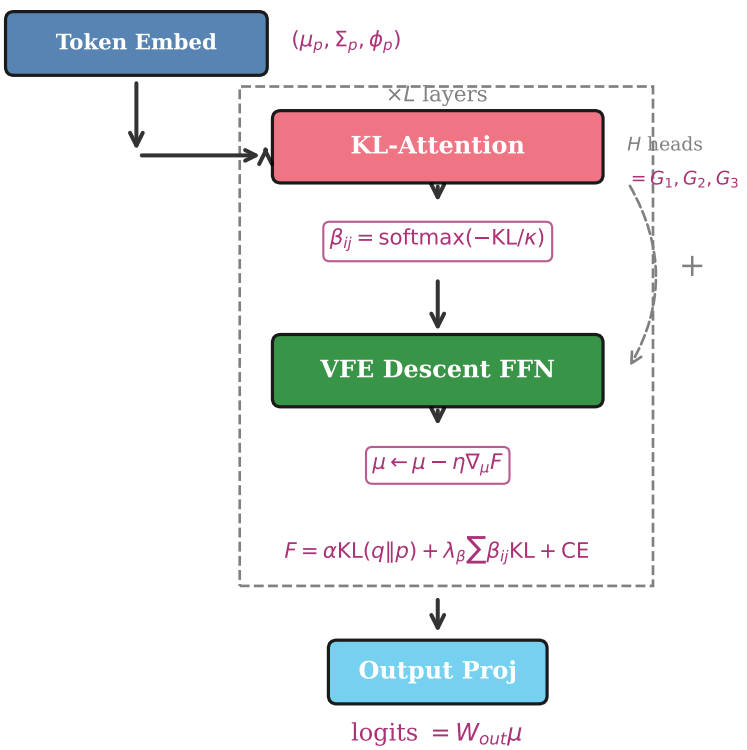
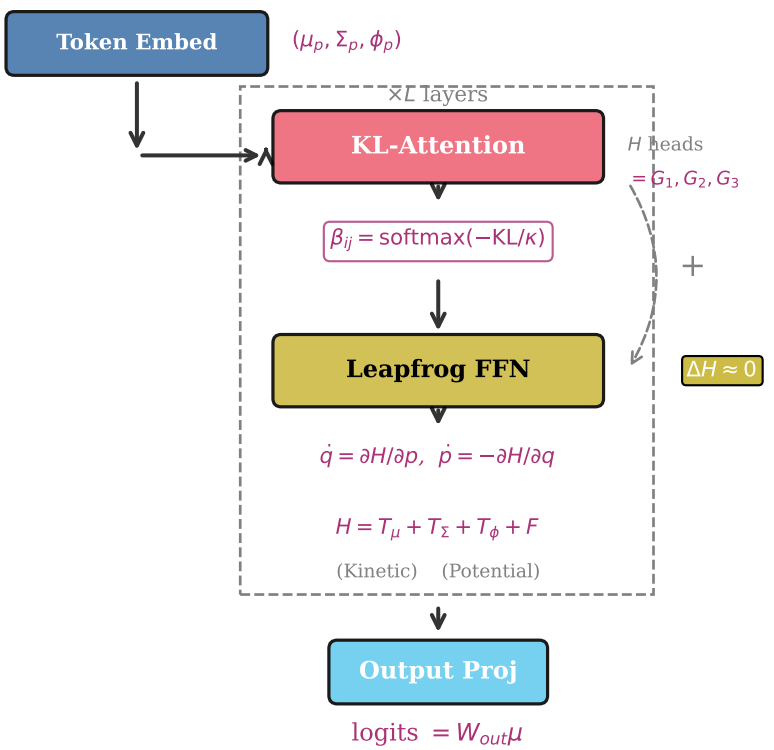
Gauge Transformer Architectures: VFE vs Hamiltonian Dynamics

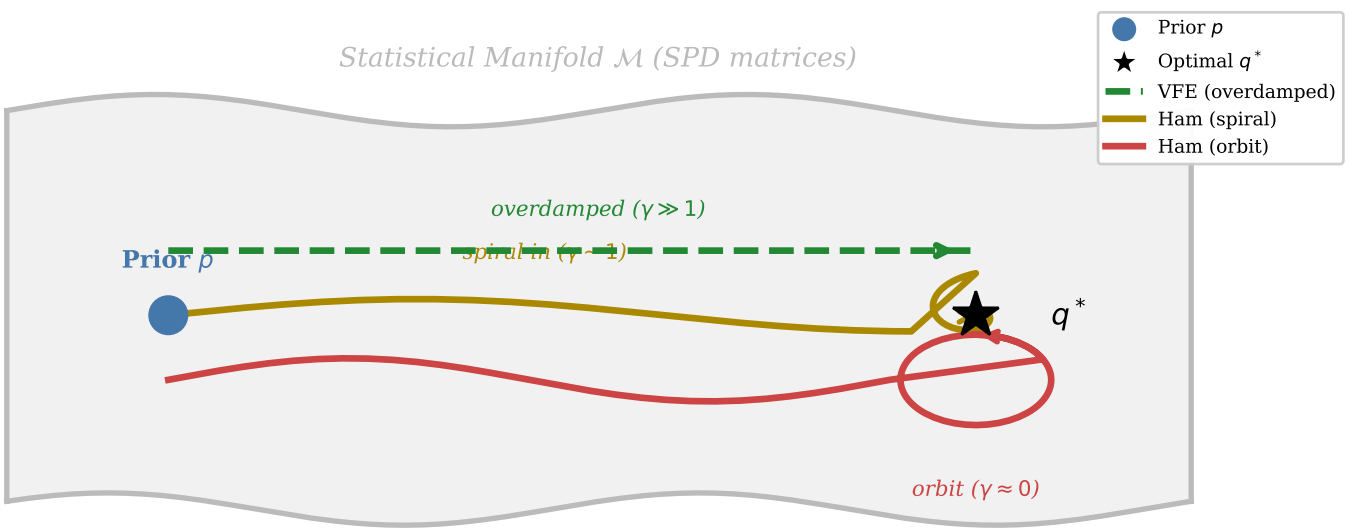
(a) Gauge-VFE Transformer



(b) Gauge-Hamiltonian Transformer



(c) Belief Dynamics on Statistical Manifold



Both architectures use KL-divergence based attention with gauge-equivariant parallel transport.
VFE descent minimizes free energy via gradient flow. Hamiltonian dynamics conserves energy via symplectic integration.
The self-consistency term KL(q||p) anchors beliefs to embedding priors, enabling gradient flow to learn embeddings.