Machine–Learned Dynamic Lattice Materials

Kagome–Perovskite–Tetradymite Architectures Under Continuous Control

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Abstract

This paper presents adaptive lattice materials whose geometry and electronic properties evolve continuously under photonic excitation and machine learning control.

1 Lattice State

$$\mathbf{L}(t) = \begin{bmatrix} \theta_i & d_i & \kappa_i \end{bmatrix} \tag{1}$$

2 Lattice Evolution

$$\mathbf{L}(t+1) = \mathbf{L}(t) + \eta \nabla_{\mathbf{L}} \mathcal{O} \tag{2}$$