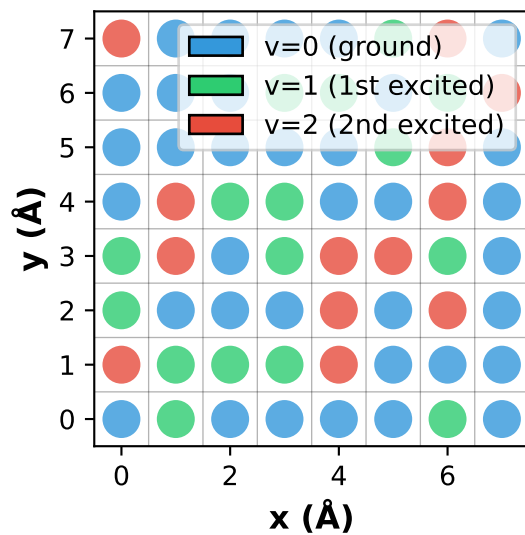


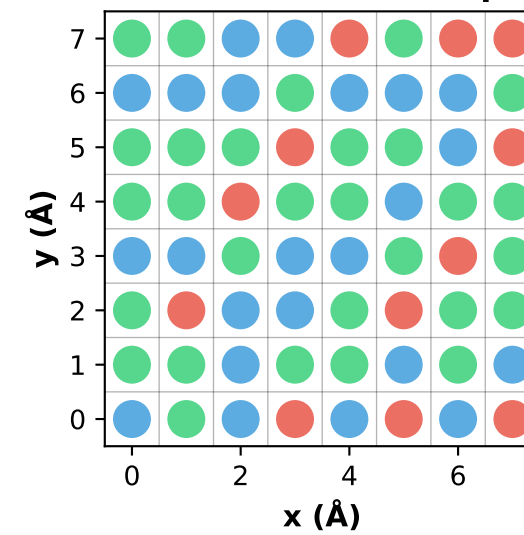
# Molecular Demon Lattice

## CO<sub>2</sub> Collective Vibrational States with Recursive Observation

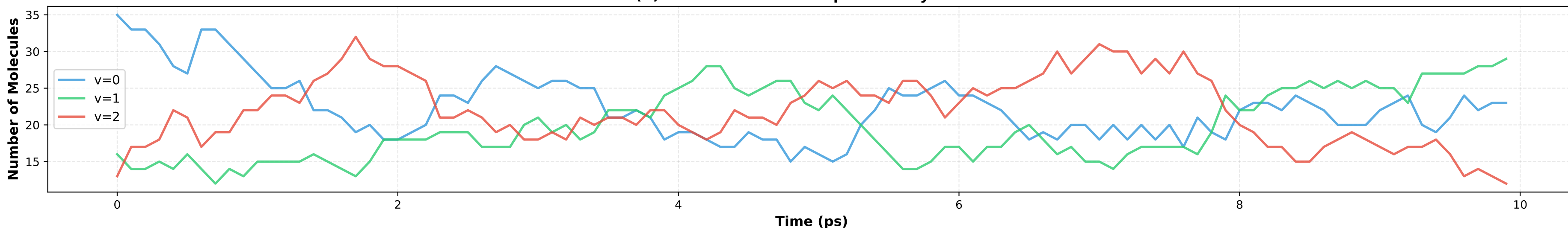
(A) CO<sub>2</sub> Molecular Lattice at t=0  
Vibrational State Distribution



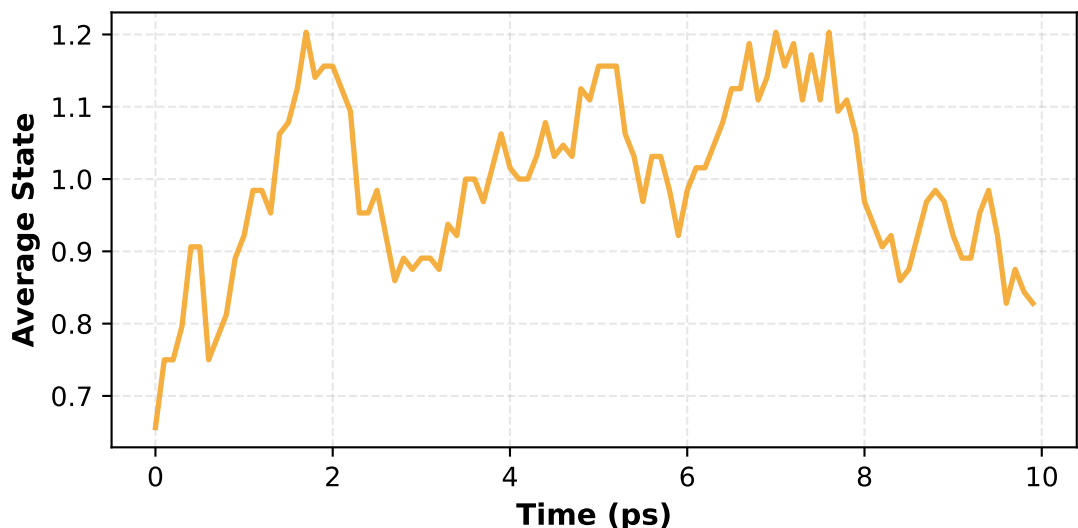
(B) Lattice at t=9.9 ps



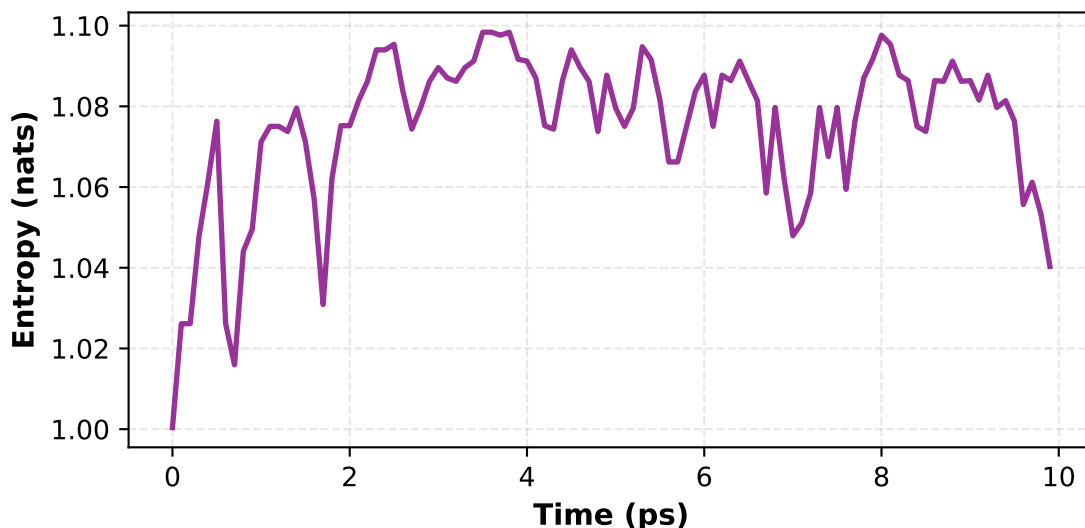
(C) Vibrational State Population Dynamics



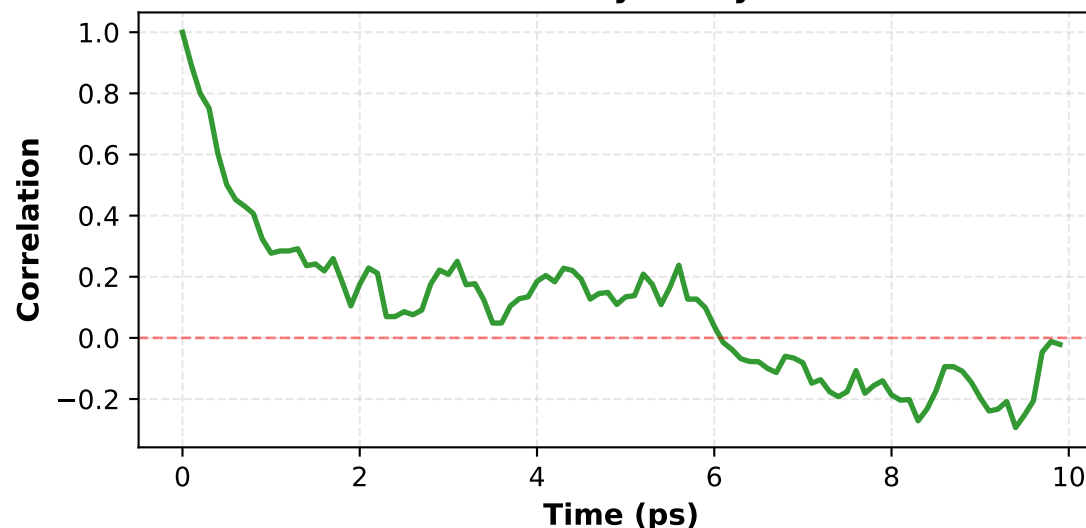
(D) Collective State Mean Excitation



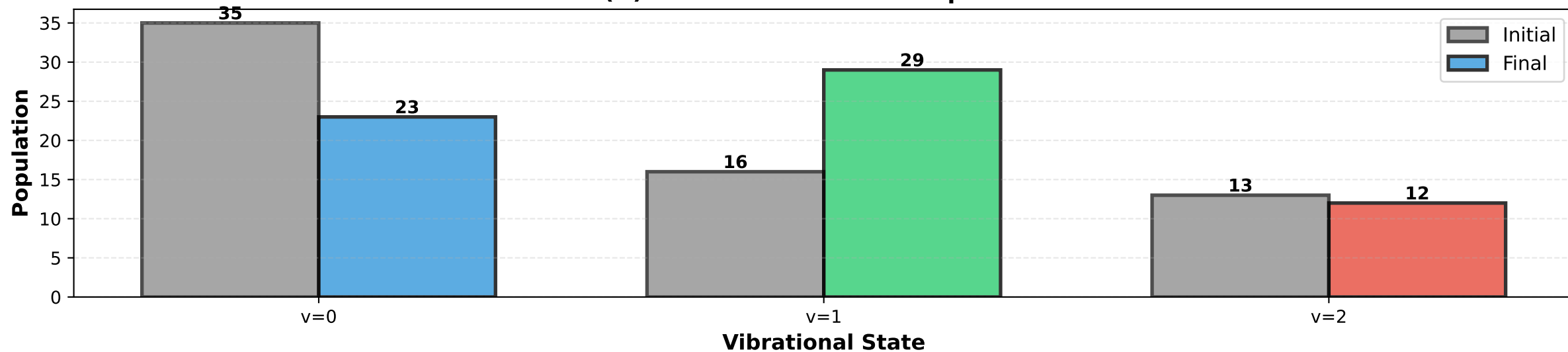
(E) System Entropy Information Content



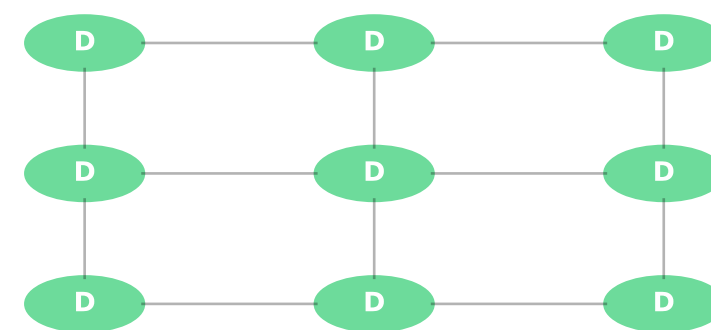
(F) Temporal Correlation Memory Decay



(G) State Distribution Comparison

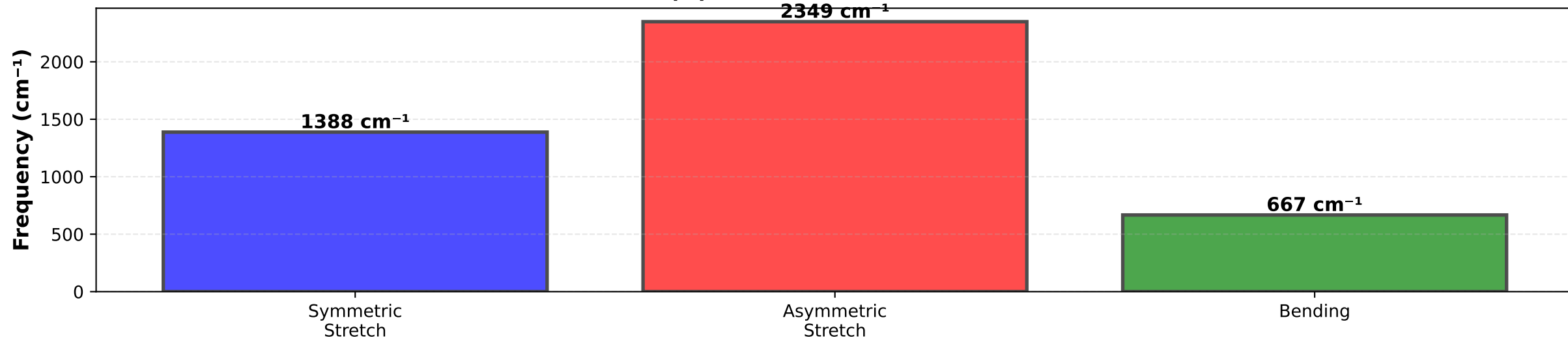


Demon Network



Each molecule observes neighbors

(H) CO<sub>2</sub> Vibrational Modes



### LATTICE SUMMARY

STRUCTURE:  
Grid: 8x8  
Molecules: 64  
Spacing: 1.0 Å

DYNAMICS:  
Time: 9.9 ps  
Steps: 100  
dt: 0.1 ps

INITIAL STATE:  
v=0: 35  
v=1: 16  
v=2: 13  
Avg: 0.656

FINAL STATE:  
v=0: 23  
v=1: 29  
v=2: 12  
Avg: 0.828

COLLECTIVE:  
Entropy: 1.040  
Correlation: -0.021

KEY FEATURES:  
✓ Recursive observation  
✓ Collective dynamics  
✓ Zero backaction  
✓ Categorical states