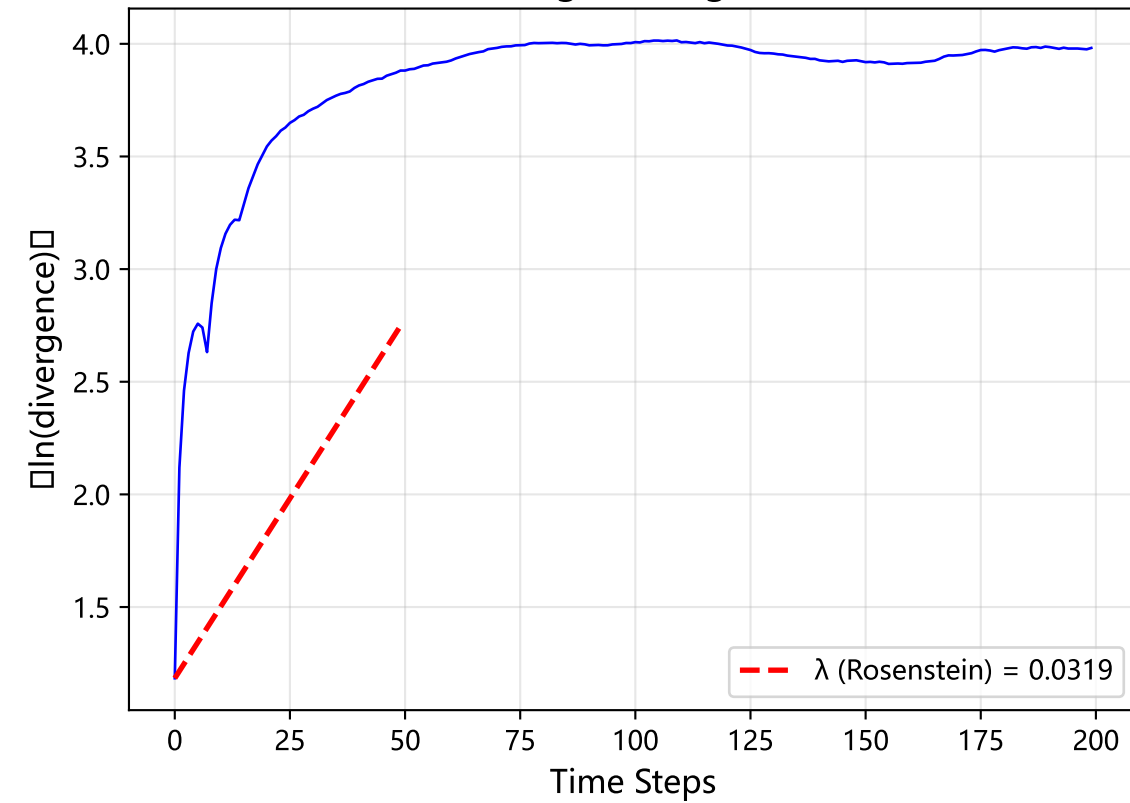
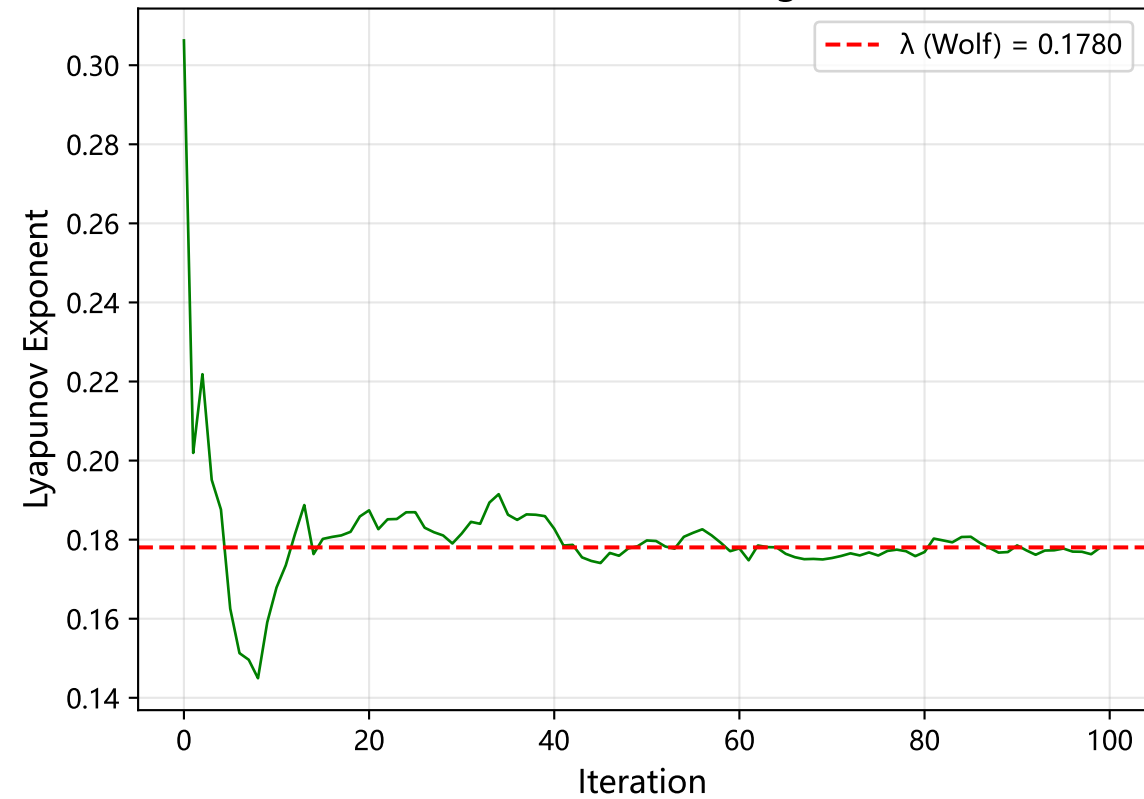


# Lyapunov Analysis: Shanghai\_Mobile

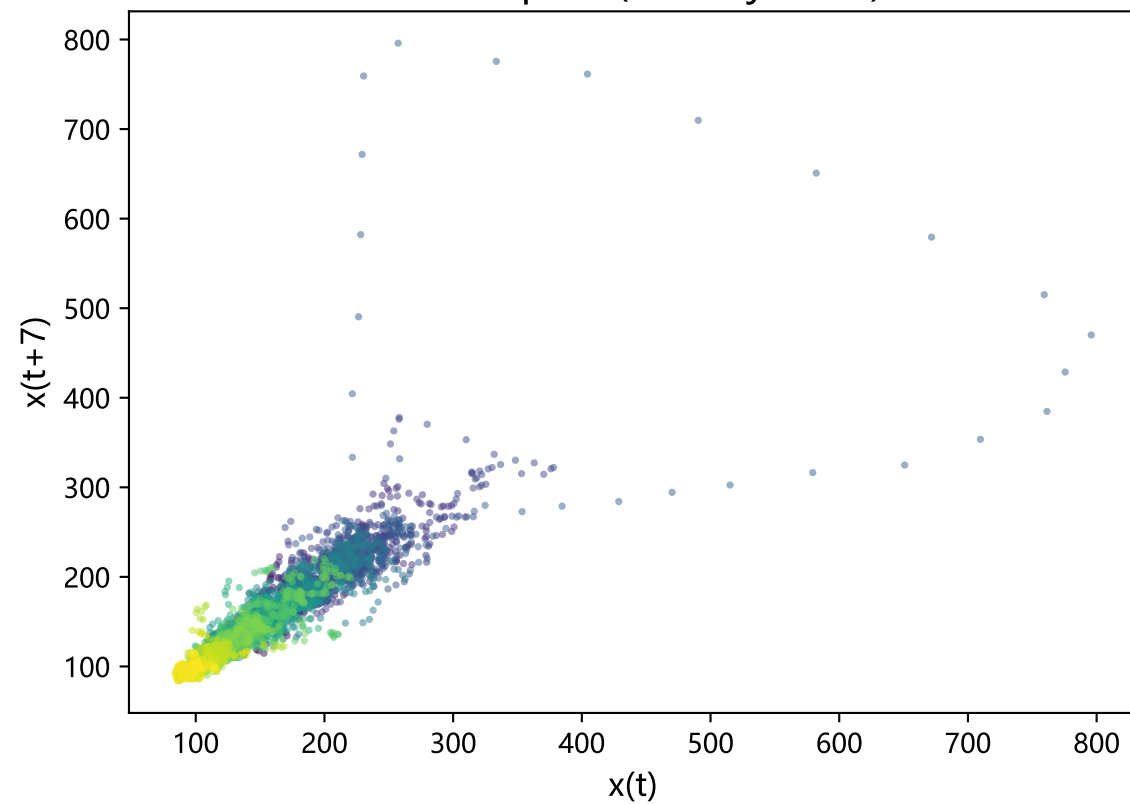
## Average Divergence



## Wolf Method Convergence



## Phase Space (2D Projection)



### Lyapunov Exponent Analysis Summary

Rosenstein Method:  $\lambda = 0.0319$

Wolf Method:  $\lambda = 0.1780$

#### Interpretation:

- $\lambda > 0$ : Chaotic behavior (sensitive to initial conditions)
- $\lambda \approx 0$ : Quasi-periodic or at edge of chaos
- $\lambda < 0$ : Stable fixed point or periodic orbit

Result: Chaotic

#### Embedding Parameters:

- Dimension: 3
- Time Delay: 7