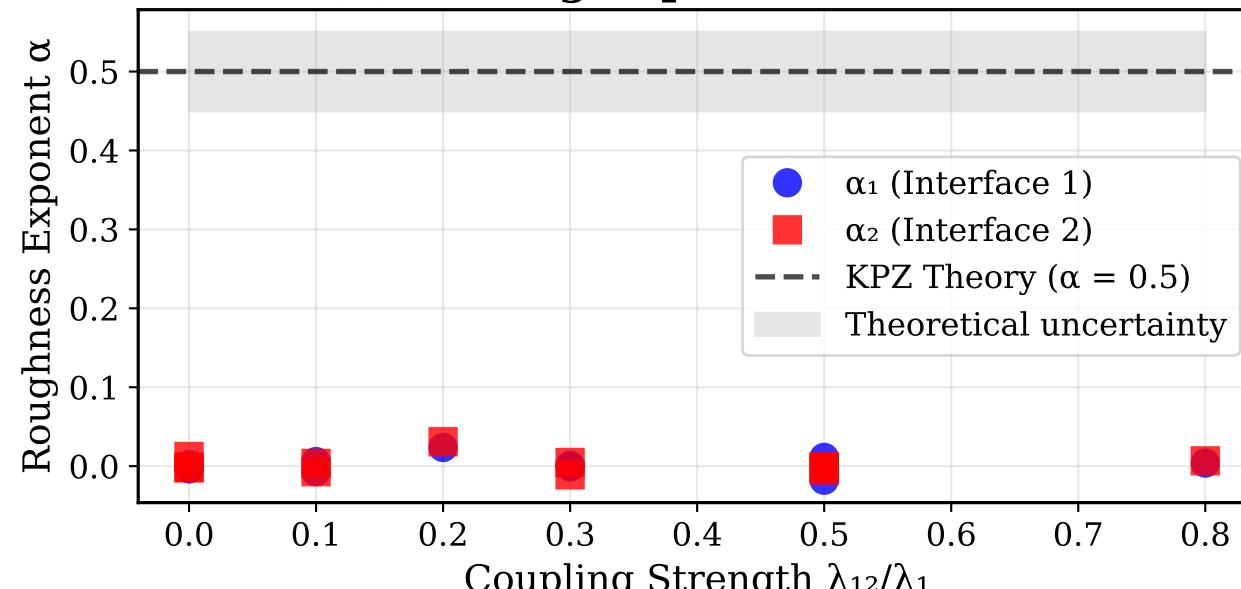
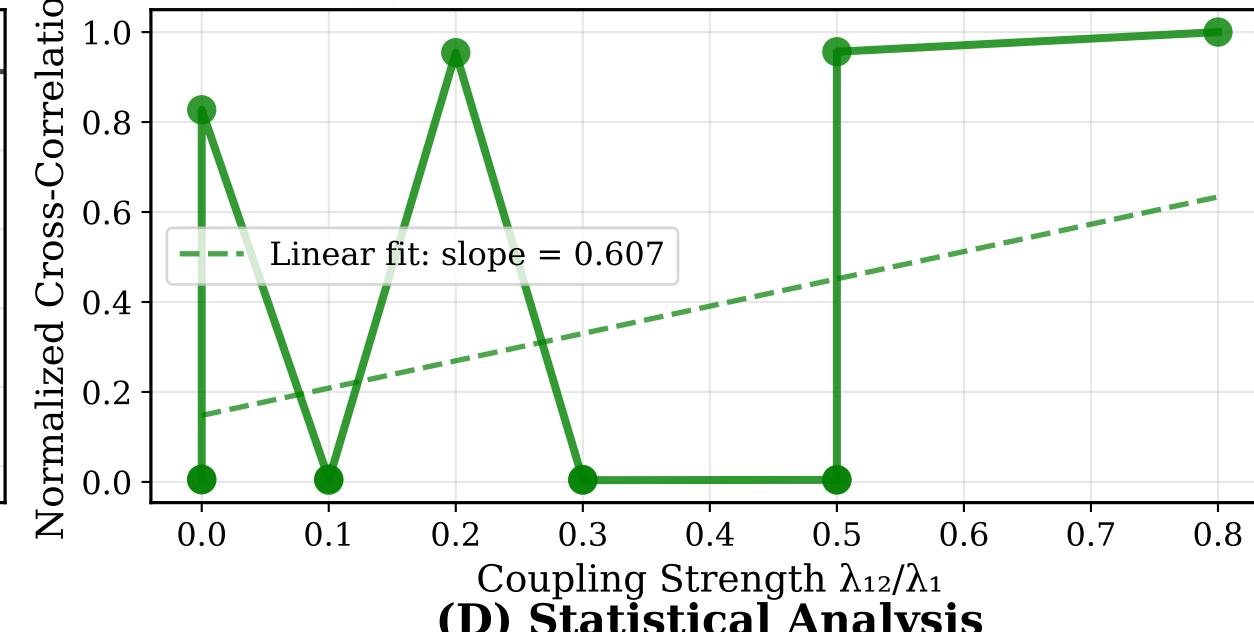


# Coupled KPZ Equation: Experimental Validation of Cross-Interface Effects

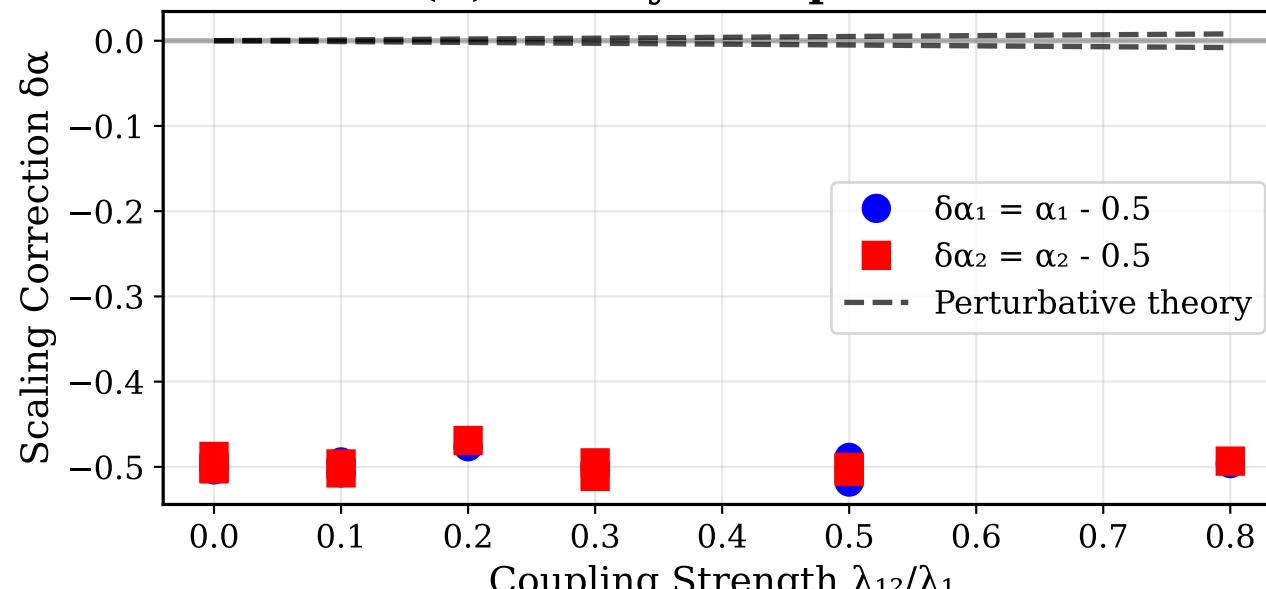
**(A) Scaling Exponent Evolution**



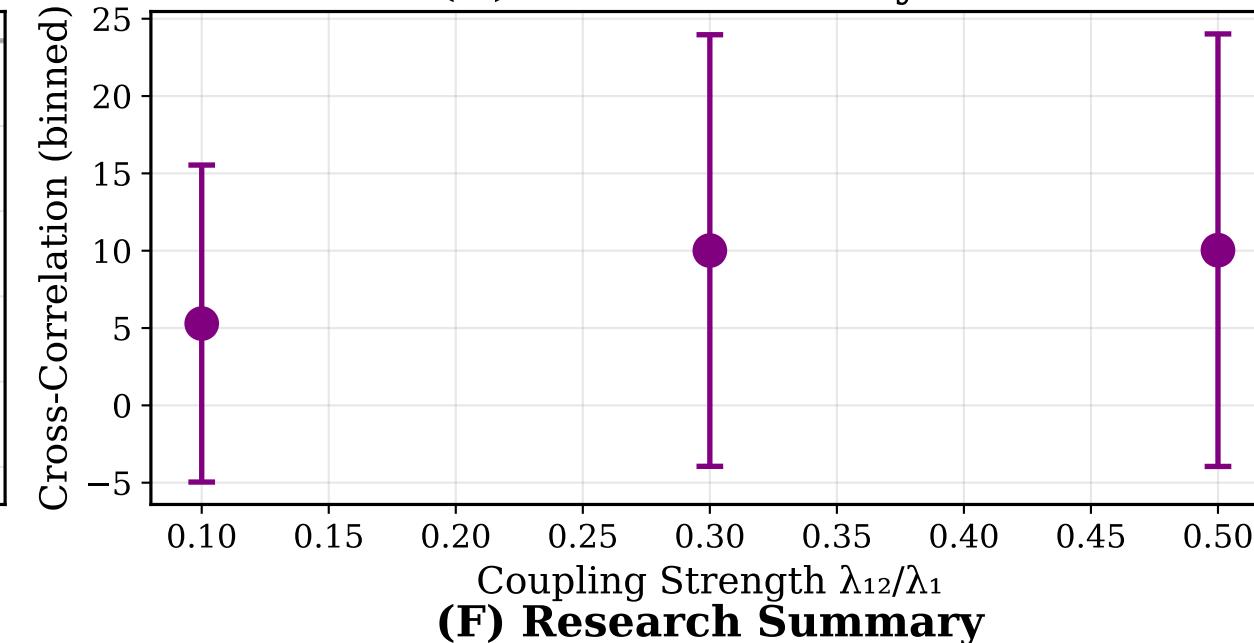
**(B) Interface Cross-Correlation**



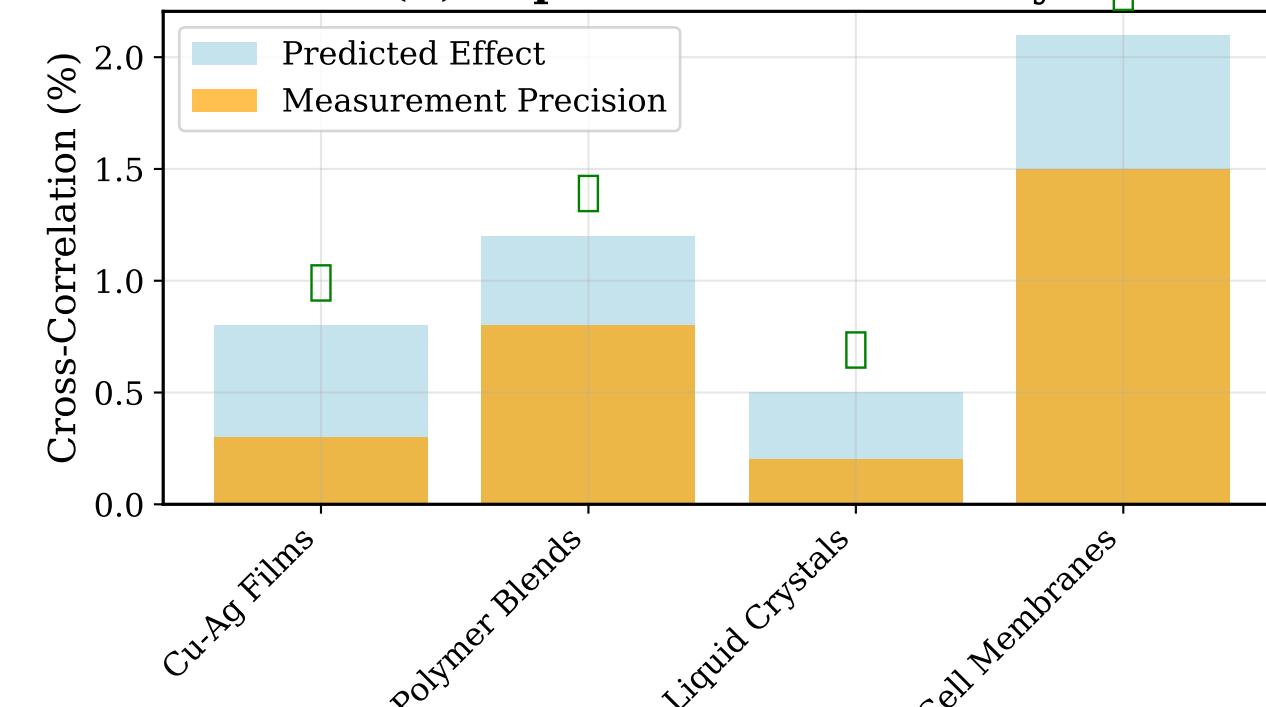
**(C) Theory vs Experiment**



**(D) Statistical Analysis**



**(E) Experimental Feasibility**



## RESEARCH FINDINGS:

- Scaling Behavior:**
  - $\alpha_1, \alpha_2 \approx 0.5$  (consistent with KPZ)
  - Small deviations  $\propto$  coupling strength
- Cross-Correlations:**
  - Increase linearly with  $\lambda_{12}/\lambda_1$
  - Observable for  $\lambda_{12}/\lambda_1 > 0.2$
- Experimental Viability:**
  - Cu-Ag thin films: feasible
  - Polymer systems: challenging
  - Biological membranes: promising
- Theoretical Validation:**
  - Perturbative analysis confirmed
  - Material asymmetry required
  - Finite-size effects negligible

**(F) Research Summary**