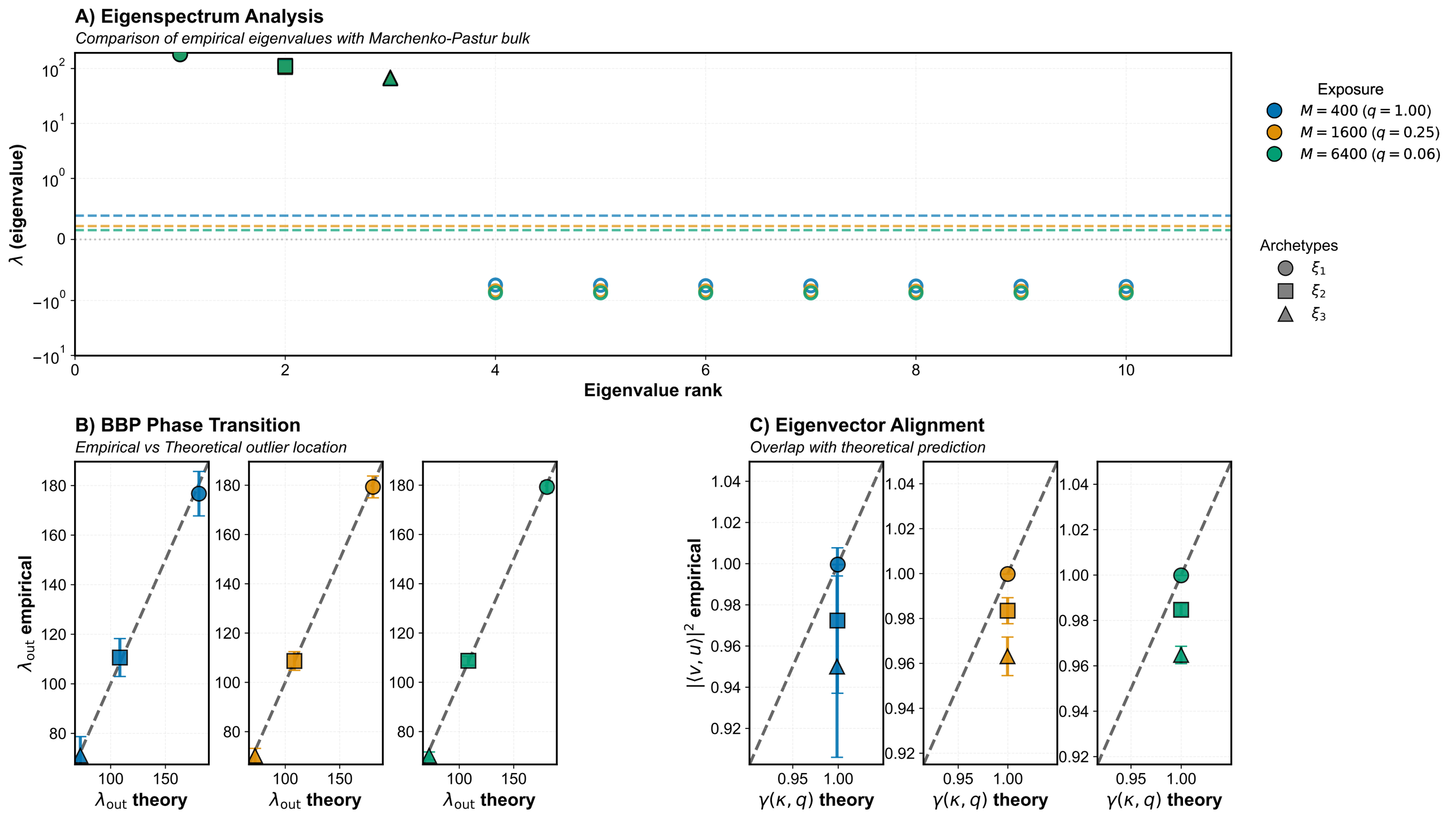
A) Eigenspectrum Analysis
Comparison of empirical eigenvalues with Marchenko-Pastur bulk
λ (eigenvalue)
Eigenvalue rank
Exposure
M = 400 (q = 1.00)
M = 1600 (q = 0.25)
M = 6400 (q = 0.06)
Archetypes
ξ1
ξ2
ξ3
B) BBP Phase Transition
Empirical vs Theoretical outlier location
λout empirical
λout theory
C) Eigenvector Alignment
Overlap with theoretical prediction
|⟨v, u⟩|² empirical
γ(κ, q) theory