Entanglement Witness Verification of Observer-Dependent Entanglement

Entanglement Witness Measurements

Witness Value ⟨W⟩ vs Context

- Separability threshold
- Entangled region
- Separable region

Values: None = 0.000, A = 0.250, B = 0.250, C = −0.500

Pauli Expectation Values

Expectation Value vs Pauli Operator (XX, YY, ZZ)

Context: None, A, B, C

Entanglement Measures Comparison

Value vs Context (None, A, B, C)

Context: None, A, B, C — S_AB, C_AB, -⟨W⟩

Noise Robustness of Entanglement Detection

Witness Value ⟨W⟩ vs Noise Level (%)

Context: None, A, B, C

GHZ State — **Context C**

Separable ⟨W⟩ = 0.5

Bell State ⟨W⟩ = −0.5

Witness Measurement

⟨W⟩ = 0.5 − 0.25(⟨XX⟩ + ⟨YY⟩ + ⟨ZZ⟩ + ⟨II⟩)

Entangled if ⟨W⟩ < 0