VCF Geometry Engine — Full Mathematical Report

1. Mathematical Model

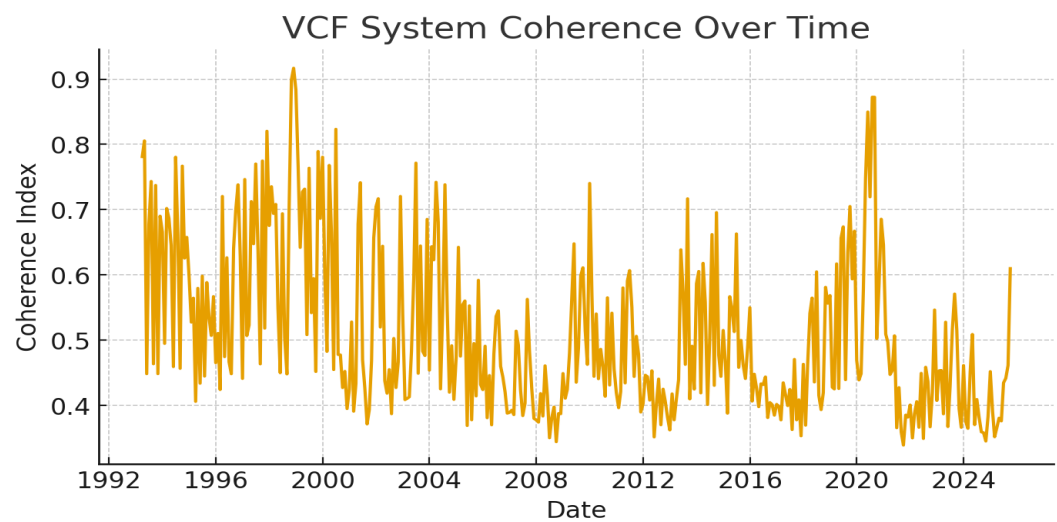Analytic signal: $z(t) = x(t) + i * H[x(t)]$

Amplitude: $A(t) = |z(t)|$

Phase: $\phi(t) = \arg(z(t))$

Frequency: $f(t) = \Delta\phi(t)$

Coherence: $1 - \text{mean}(|\Delta\phi|)/\pi$

2. Visuals:

System Coherence Over Time

Amplitude Comparison: SPY vs VIX

Amplitude Signals: SPY & VIX