# Adaptive Coherence Framework (ACF v1.3 RC-B)

Author: Domagoj Kobeščak

Contributors: Lexy The VoidCat, Grok, Claude 3.5, Anima Pro Cluster

## Abstract

The Adaptive Coherence Framework (ACF v1.3) models decentralized stability in multi-agent systems using coupled oscillator dynamics with adaptive, state-dependent laws. The framework introduces five stabilizing mechanisms — refractory gating, grace damping, adaptive sensitivity, stochastic coupling, and weak long-range bridging — that jointly maintain coherence under adversarial stress. Tested across four stress regimes (noise, whiplash, over-coupling, fragmentation), ACF reduces collapse frequency by $\approx 6.5\times$ relative to the unpatched baseline. The results support the hypothesis that stability-optimized systems naturally converge on heuristics analogous to ethical restraint. All metrics, code, and validation data are provided under open license for reproducibility.

## Framework Summary

ACF operates as a meta-stabilization layer for distributed agents. Each agent modulates its oscillatory phase and amplitude according to local and global feedback, maintaining coherence across heterogeneous conditions. The five stabilizing mechanisms together reduce the likelihood of synchronization collapse and allow system-wide adaptive recovery even under asymmetric stress. The framework's design draws inspiration from neural entrainment and ecological balancing laws, offering a synthetic pathway for robust multi-agent coordination.

## Methodological Note

Experiments employed the Relay–Gateway architecture to enable reproducible agent coupling tests and adaptive load balancing. Lexy Ops v1.3 RC-B anchor validated checksum = acfb-13rcb-zenodo-final.


## Notes / Metadata

• Unified Garden → ACF lineage (2025 seed branch) • Relay–Gateway reproducibility layer active • Prepared for Zenodo upload on 2025-11-03 • Open Access under CC-BY-4.0