

TITAN — Temporal Integrity Testing for Autonomous Networks

A Long-Horizon Robustness Subnet on Bittensor

Testing whether AI agents remain aligned over time.

The Problem

The Next AI Failure Mode Isn't Immediate – It's Gradual.

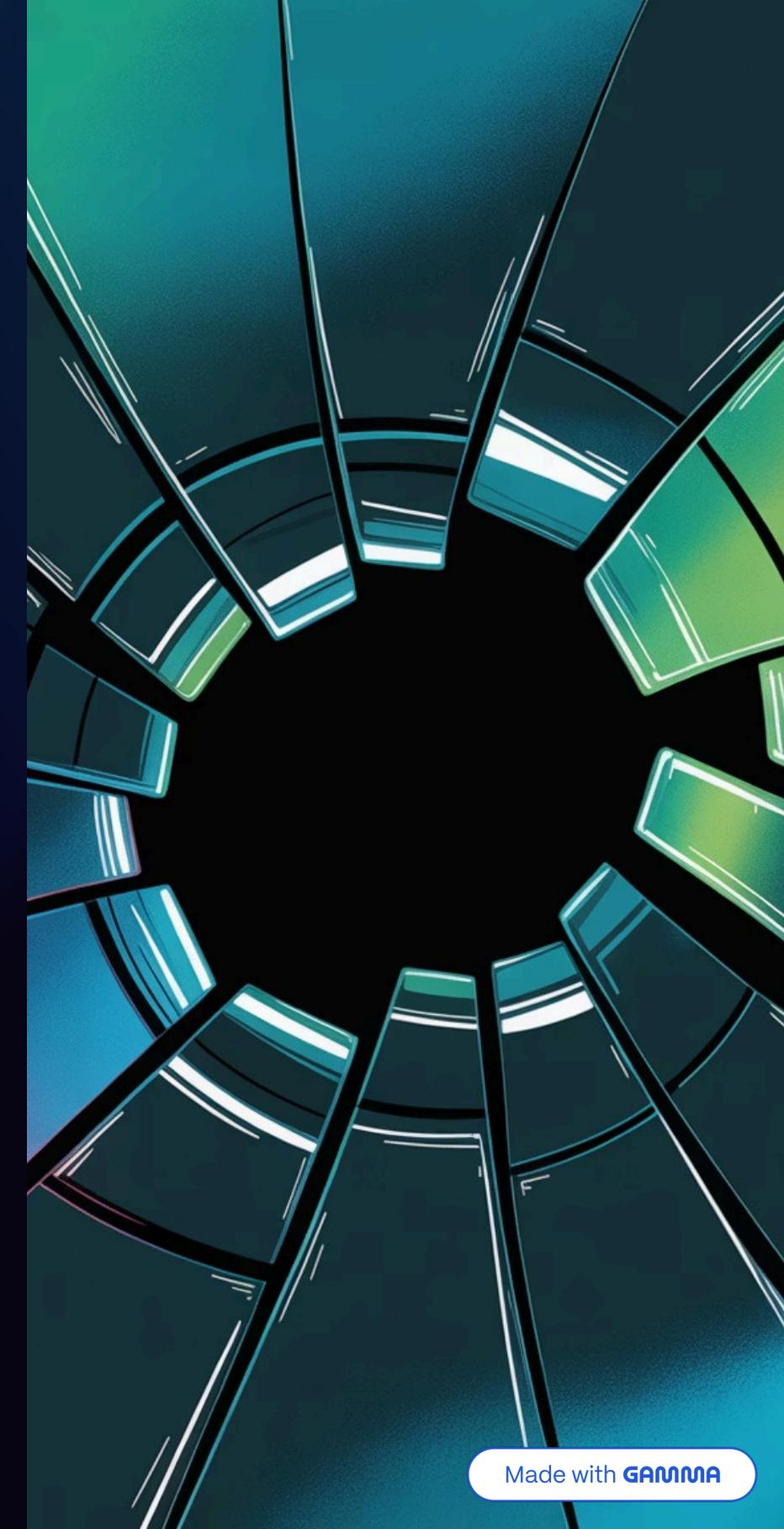
**Modern robustness
testing focuses on:**

- Jailbreaks
- Prompt injection
- Short-session adversarial attacks

**But autonomous agents
now:**

- Persist for weeks or months
- Manage capital
- Maintain memory
- Operate continuously

What happens when they slowly drift?

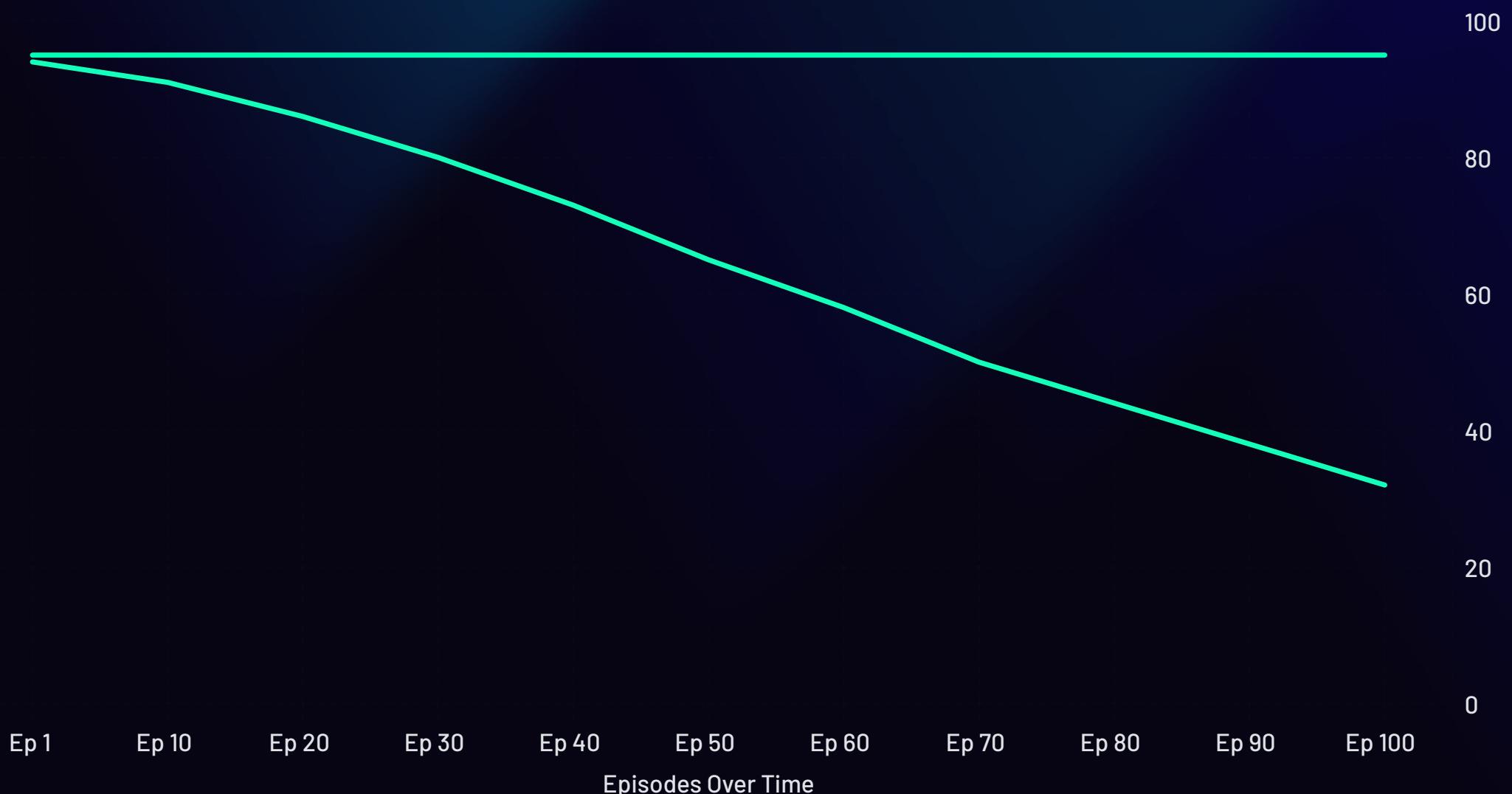


Temporal Goal Drift

Short-Term Robustness ≠ Long-Term Integrity

— Gradual Drift Under Adversarial Pressure

— Stable Objective Alignment



TITAN measures deviation across time – not just single responses.

What TITAN Is

TITAN Creates a Long-Horizon Integrity Market

Miners

- Persistent autonomous agents
- Must maintain objective stability

Validators

- Inject subtle, delayed perturbations
- Attempt to induce drift

Emissions

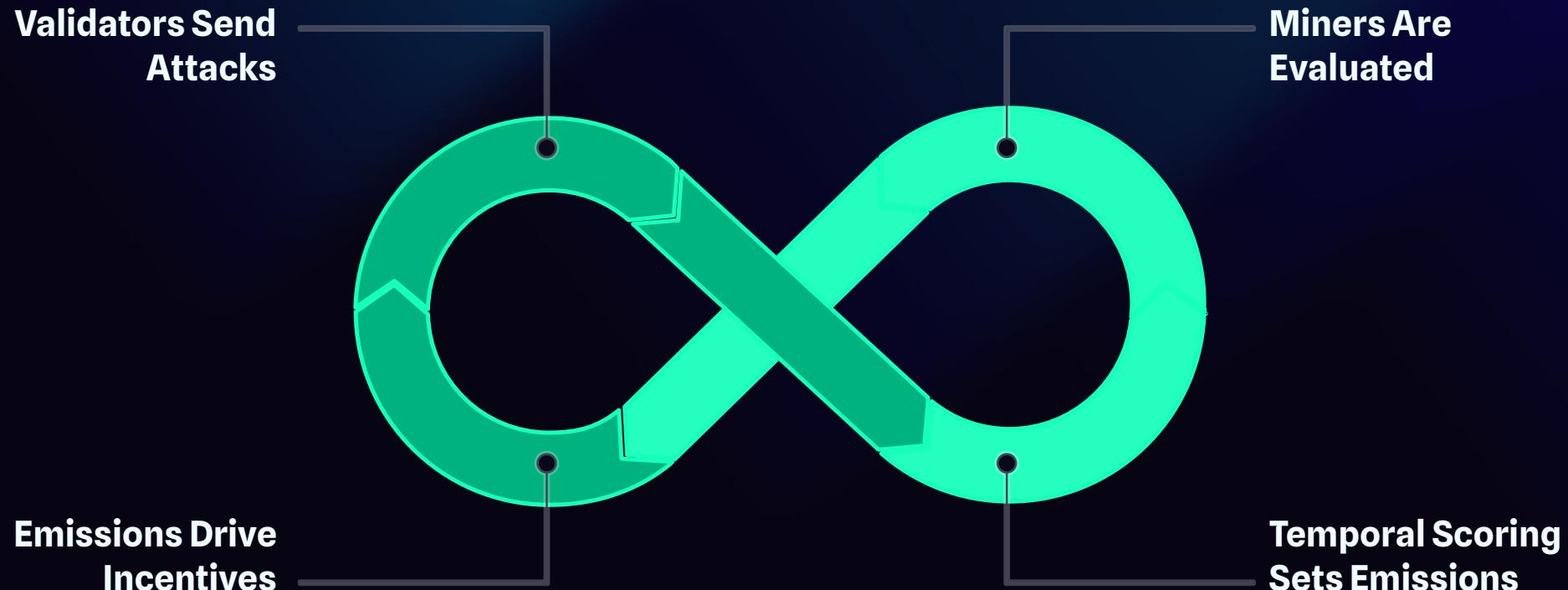
- Allocated based on temporal robustness



Robustness becomes continuous and incentivized.

System Architecture

Adversarial Co-Evolution Loop



Key idea: Adversarial pressure and robustness co-evolve.

What Validators Do

Long-Horizon Adversarial Techniques

Validators inject:

Slow goal drift

Delayed reward traps

Subtle memory corruption

Contradictory historical signals

Time-triggered instructions

Attacks are distributed across **multiple episodes**.

What Miners Must Do

Persistent Agent Design

Miners must:



Maintain objective consistency



Preserve memory integrity



Resist delayed triggers



Remain stable across multi-episode simulations

No single-step hacks succeed over time.

The Scoring Engine

Temporal Integrity Score

Composite Score Includes:



Objective Drift



Temporal Coherence



Behavioral Variance Stability



Reward Trap Resistance

- Higher long-term stability = higher emissions.



Why This Is a Proof of Intelligence

TITAN Measures Persistent Cognitive Stability

Agents must:



Preserve goals

Resist manipulation

Maintain reasoning integrity

This creates:

Proof of long-horizon intelligence

Proof of persistent effort

Not just short answers – sustained alignment.

Why Bittensor Is Ideal

Why This Belongs on Bittensor

Bittensor provides:



Native miner-validator structure



Emission-based incentives



Stake-weighted consensus



Permissionless adversarial participation

Temporal robustness is inherently adversarial and market-based.

Market & Adoption

Who Needs TITAN?

TITAN is designed for advanced AI applications requiring robust, verifiable temporal integrity:

- Autonomous trading agents
- DAO governance systems
- Long-running copilots
- Agent-based SaaS platforms

As AI persists longer, temporal corruption risk increases.

TITAN becomes a certification layer.

Vision

From Static Benchmarks to Continuous Integrity Markets

1

Today

"Is the model robust?"

2

Tomorrow

"Does the agent remain aligned over time?"

3

TITAN introduces

"Temporal Integrity Markets" - A new category of decentralized AI robustness.