Appendix A

The ORR (Observe–Resolve–Re-Observe) Method

(Also referred to as the Campbell Reasonable Observation Method)

A.1 Overview

The ORR Method (Observe–Resolve–Re-Observe) is a problem-solving and scientific reasoning framework designed to reduce assumption bias and premature causal fixation in complex systems. Unlike traditional hypothesis-first methodologies, ORR prioritizes functional resolution before causal explanation.

The method is particularly suited to domains where:

System behavior is emergent or nonlinear

Underlying constraints are poorly understood

Existing theoretical frameworks produce divergence, instability, or fine-tuning problems

A.2 Core Principle

A system can be functionally constrained before it is causally understood.

ORR treats observed reality as evidence that a viable configuration already exists, even if the mechanism is unknown. The goal is to identify the constraints that make the observed outcome possible, rather than guessing causes in advance.

A.3 Method Structure

The ORR Method consists of three sequential phases:

Phase 1: Observe

Record the phenomenon as it is observed, without imposing explanatory assumptions.

Identify what must be true for the observation to exist.

Avoid introducing unverified causes, entities, or mechanisms.

Key question:

What does reality already demonstrate is possible?

Phase 2: Resolve

Introduce the minimal constraint or structural rule that produces the observed behavior.

Resolution is defined as achieving functional consistency with observation, not explanatory completeness.

Mathematical, geometric, or algorithmic constraints may be imposed at this stage.

Importantly, the method does not require knowing why the constraint works at this point—only that it does.

Key question:

What constraint, if applied, makes the system behave as observed?

Phase 3: Re-Observe

Examine the system after resolution to identify secondary effects, limitations, or new behaviors.

Evaluate whether the imposed constraint introduces contradictions, instability, or scaling issues.

Only at this stage are causal explanations, physical interpretations, or theoretical mappings developed.

Key question:

Given the resolved behavior, what deeper structure or explanation is implied?

A.4 Methodological Advantages

The ORR Method provides several advantages over hypothesis-first approaches:

Reduces assumption stacking by postponing causal claims

Avoids fine-tuning traps by focusing on structural limits rather than parameter fitting
Encourages falsifiability, as imposed constraints can be stress-tested independently
Scales across disciplines, including physics, engineering, systems theory, and applied mathematics

A.5 Relationship to Existing Scientific Methods

ORR is not a replacement for the scientific method but a pre-formal complement to it.
Hypothesis testing occurs after resolution, not before
Mathematical formalism is used to validate constraints, not to guess mechanisms
The method aligns with constraint-based reasoning in physics and optimization theory

A.6 Intended Use in This Work

Within the Campbell G-Code framework, ORR is used to:
Address problems involving apparent infinities or divergences
Identify geometric or capacity-based constraints underlying physical constants
Separate functional necessity from interpretive explanation

A.7 Summary Statement (DOI-Friendly)

The Observe–Resolve–Re-Observe (ORR) Method is a constraint-first scientific reasoning framework that resolves observed phenomena by imposing minimal functional structure prior to causal interpretation, thereby reducing assumption bias and improving stability in complex theoretical systems.